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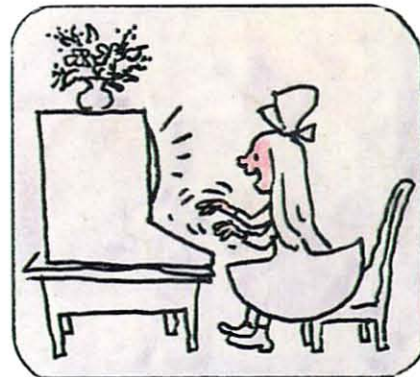
VOLUME 1
NUMBER 4

FAMILY COMPUTING

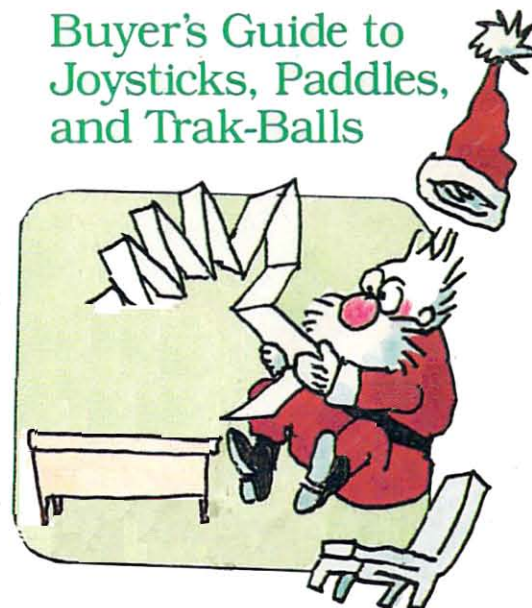
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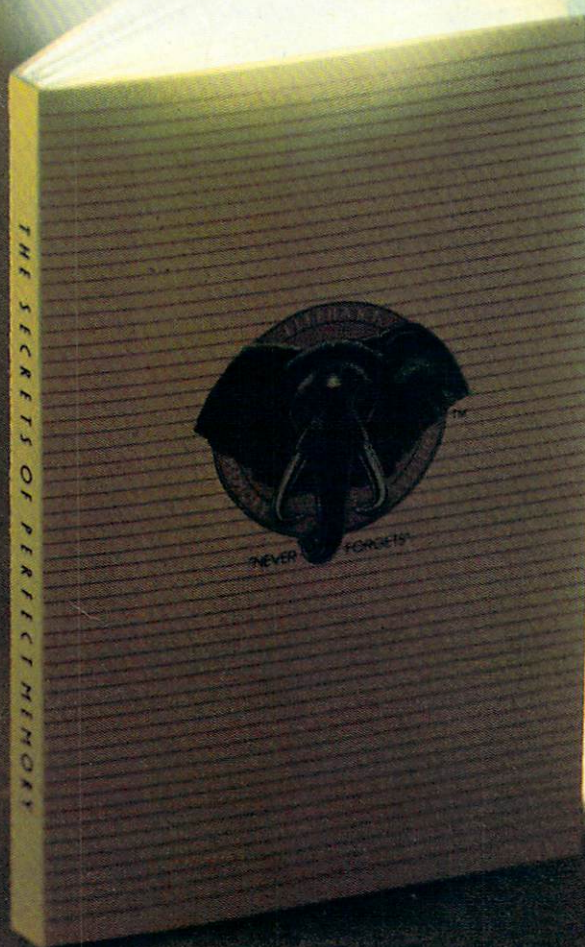
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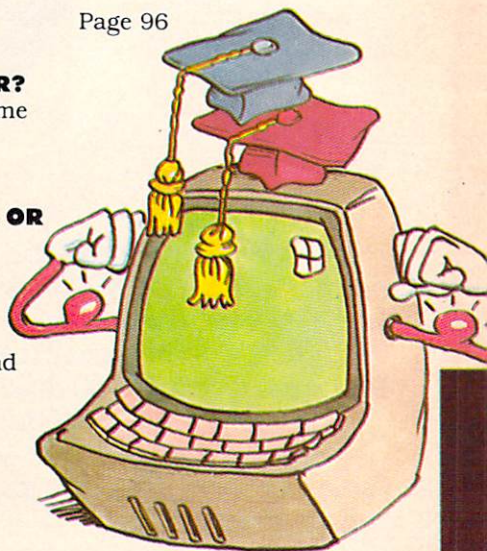
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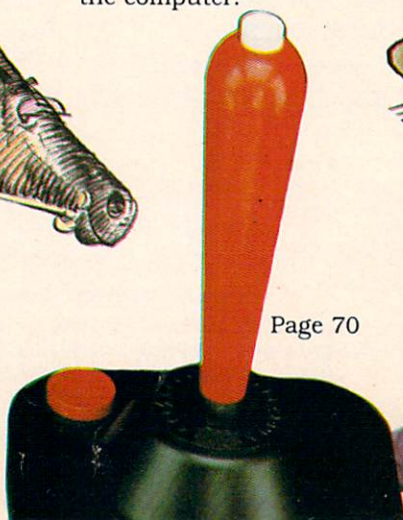
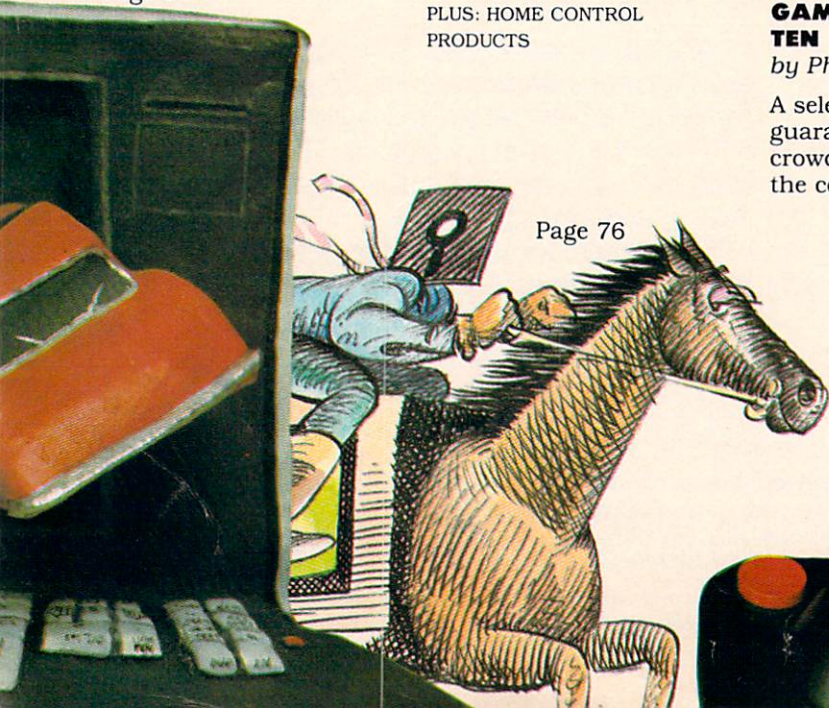
Part two of a special report on ergonomics.

PLUS: A CAPSULE GUIDE TO AN ERGONOMIC WORKSTATION

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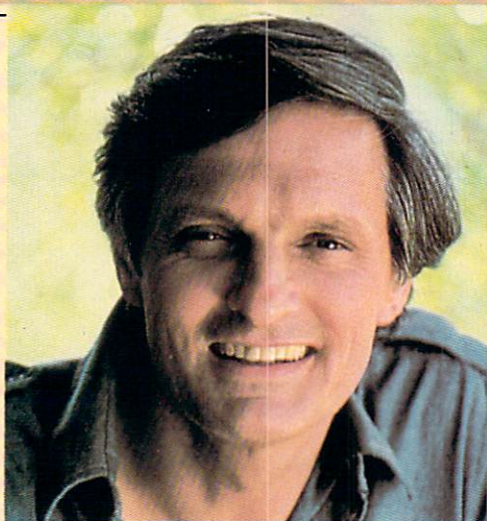


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Computer enthusiast Alan Alda uses the ATARI 800XL Computer System. Alda reports: "It's going all the time!"

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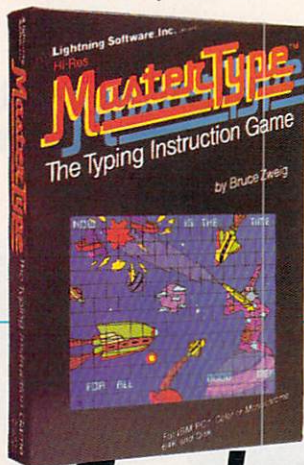
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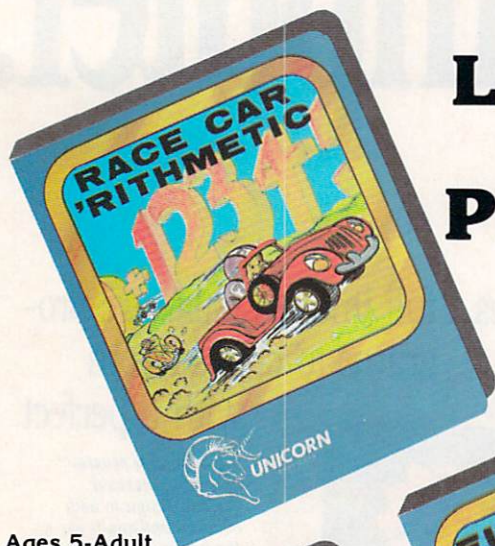


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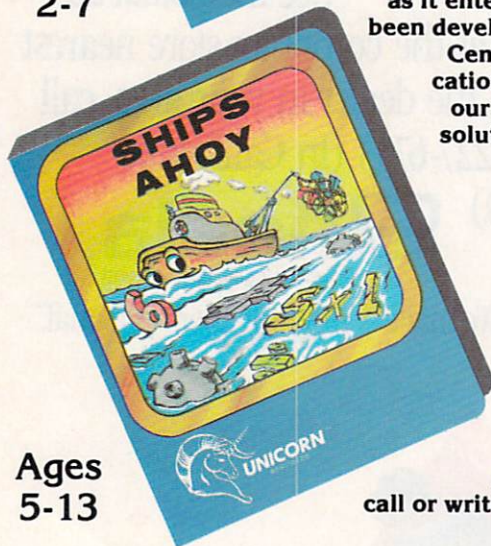
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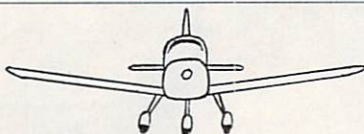
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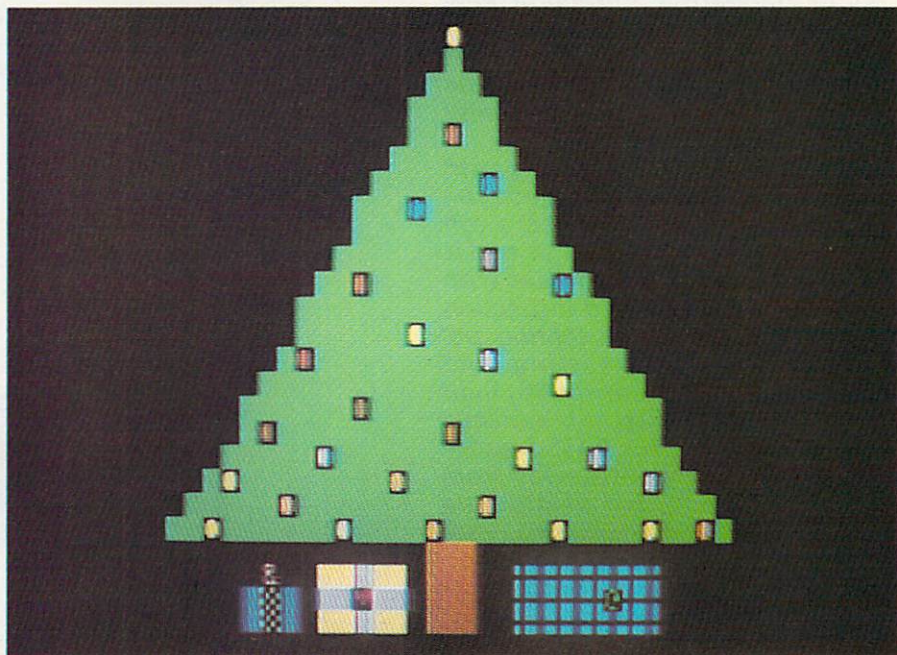
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EDITOR'S NOTE

LET US HELP YOU PROGRAM SOME FUN INTO YOUR HOLIDAYS



Each Christmas season brings multitudes of new computers into American homes. And with the computer comes a lot of joy—and a lot of confusion and frustration. After the boxes are opened and the system assembled, a chorus of voices can be heard saying, "Now what?"

In every issue of *FAMILY COMPUTING* we try to say "Here's what!" We feature stories of families using their computers in countless ways, but our special gifts to our readers—every month—are our programs. Because we've chosen to focus all our attention on how families use computers at home, we're able to tie in our programs with popular activities that are taking place each month. Joey Latimer, who writes many of our holiday programs, is busy in his California mountain cabin writing fall programs in the spring and spring programs in the fall.

Aware that many of our readers are just starting out, we try to keep most of our programs short enough so they don't try even a novice's patience. And, to make it as easy as possible to key in our program listings, we include versions for all of the most popular computer brands sold for home use.

Our computer lab is always busy, filled with programmers working under the direction of Lance Paavola,

our technical editor. Each program goes through several rewrites until it's as concise as possible. Lance's standards for excellent programming never falter, which means that as our readers start trying their hand at programming themselves, they start with excellent models to emulate.

So, as you try our *Christmas Tree* program (p. 110), create your own wrapping paper (p. 128), or ponder over our puzzle (p. 140), remember that as early as last summer programmers were humming the background music that goes with our tree, testing the paper programs, and trying their hand at the puzzle.

Another gift to you is this month's cover by renowned cartoonist George Booth. Each month his special humor will be found in the pages of *FAMILY COMPUTING*, under the heading "BASIC Booth."

We hope you're smiling at your computer this holiday season, and at some of the fun and success we'll be bringing you issue after issue. Meanwhile, all of us at *FAMILY COMPUTING* wish all of you a wonderful time computing.

Claudia Cohe

CLAUDIA COHL
EDITOR-IN-CHIEF



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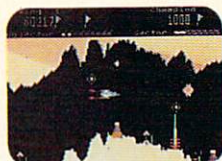
Our Music Will Have You Hearing Things. Going out of your mind never sounded so good.

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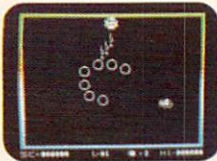
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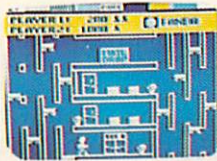
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Deathly strategy. Mash the monsters! Let the visitors live.



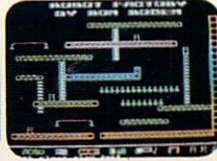
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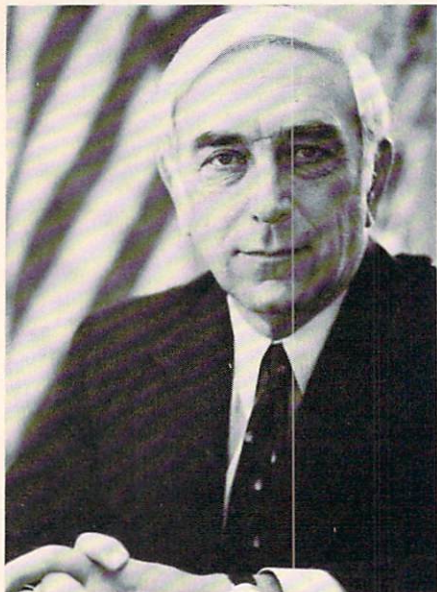
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BEHIND THE SCREENS

PEOPLE, NEWS, AND TRENDS

EDITED BY JOHN WALLACE

Everybody, On-Line!



Computer Education Assistance Act sponsor
Frank Lautenberg.

The so-called computer revolution has taken the country by storm, and while many sectors of our society have managed to stay afloat and are indeed prospering because of it, others have been left behind and are somewhat adrift. Recognizing this "accessibility gap," Senator Frank R. Lautenberg (D-NJ) introduced a bill in September to ensure that everyone has proper and equal exposure to the new technologies.

Titled the Computer Education Assistance Act, the bill calls for \$150 million to be spent annually over the next four years, for the purpose of helping schools plan and implement computer use. Lautenberg says that "half the bill's funds are designated for poorer districts." This would balance what he sees as an inequity of access between schools in suburbs and those in cities, such as his own Newark, Paterson, and Camden.

If you've got a good bite-sized piece of computer-related news involving people, trends, or innovations, let's hear it. We will pay \$25 for each item we publish. Write to Behind the Screens, c/o FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

Lautenberg emphasized the importance of the planning stage in schools' introduction of computers in the curriculum. "Clearly, computer education is not a substitute for the three Rs," he said. "Computers are more like pencils than books. As educators come to view computers... as tools, they will begin using them in exciting and mind-expanding ways, which is their true promise."

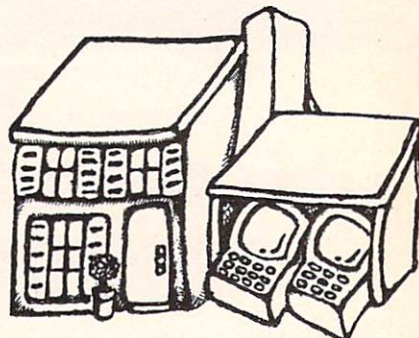
Lautenberg can appreciate the advantage of being well informed of and well adjusted to the computer age. Thirty years ago he and two colleagues started a basic bookkeeping firm. By the time he left the company last year, it had grown into a multimillion dollar computer-based data-processing firm employing over 16,000 people in offices across America and in four other countries.

The Senator is concerned chiefly with the issue of exposure to the potential of computers. "A report in *The New York Times* said that in Westfield, New Jersey, 50 percent of the students had contact with computers," Lautenberg said. "But when you get to poorer districts, you see that kids don't have them at home, they don't have them at schools. We're hoping that this bill will show people who don't have the exposure, that there's nothing to fear, and that there's more to computers than just games." The bill requires that schools make their facilities available for adult education during nonschool hours. "There are very few jobs that won't have some sort of computer interface," he says.

As for his own family, Lautenberg says that all of his three children have put the computer to extensive use. "My youngest son is 15. His sisters use computers a great deal at work, but he's still at the stage where he spends too much time playing games," he told FAMILY COMPUTING.

Says Lautenberg, "We're just trying to show that this isn't like a slide rule arithmetic device. The computer's not a fancy engineering tool. A lot of people in the work force are afraid that you have to have a college degree to work these things. That's just not true."

Two-Computer Households



The two-computer household may become the latest trend in the rapidly changing world of consumer electronics. Like autos before them, computers are proving invaluable for many families. And for many, even computers in tandem are becoming a necessity, according to the results of an 11,000-family survey conducted by the Illinois-based research firm, Talmis.

"It's not only that these families are moving up to better computers," reports Talmis researcher Jeanne Dietsch. "In many cases, families are buying the same computer again." As many as one out of six computer-using families plans to purchase a second one within the next year.

The reasons vary, according to Dietsch. For one thing, it seems that use of computers has increased dramatically among preteens. They're frequently using the family computer for school work. And they're finding that more and more software is becoming available for them to choose from. Teens are discovering the advantages of word processing and, according to Talmis Marketing Research Director Hank Butler, family-managing mothers are drawn to the home-accounting possibilities in numbers larger than analysts had initially anticipated.

Many families are clearly still testing the limits and potential of their new machines. But before long, if Mom, Dad, and the kids all continue to itch for a turn, the two-computer household may be as common as the two-car garage.

WHILE OTHER COMPUTER COMPANIES ARE BUSY SETTING NEW PRICES, SPECTRAVIDEO IS BUSY SETTING NEW STANDARDS.

MSX™ and LOGO™: Two more reasons why Spectravideo is leading the way in Personal Computers.

While price wars and confusion reign all around us, Spectravideo goes about its business, setting standards by which all other personal computers will soon be judged. MSX and LOGO are the two latest examples of how Spectravideo is rocking—and reshaping—the personal computer industry.

MSX AND LOGO.

It is now history that, on June 15 1983, Spectravideo, Inc. joined with most of Japan's largest electronics firms to launch MSX. The most far-reaching personal computer standard in history. MSX is the name given to a specific hardware/software configuration that makes product interchangeability possible. While Spectravideo is proud to participate in MSX, we are even prouder of this fact: It was our own SV-318 computer that was used as a prototype for the MSX design! There are two important aspects to this.

First, all future MSX hardware—i.e. computers, peripherals, appliances—will be based on several key design elements of the SV-318. What does this mean to you, the consumer? A great deal, because when you buy an SV-318, you will not only be able to use all of Spectravideo's own software and hardware—you'll also be able to take advantage of all the remarkable new equipment that will be coming from other MSX participants.

In addition, the software aspect of MSX was largely inspired by the software built into the SV-318. From the outset, Spectravideo offered built-in Microsoft BASIC as its resident interpreter. Now, Microsoft also makes a LOGO program compatible with the SV-318. It was Spectravideo's Microsoft BASIC/LOGO that helped to make MSX possible.

Another standard that Spectravideo can take credit for is the built-in Joystick/Cursor Control. Built right into the SV console, this control is always at fingertips and is much easier and faster to use than external joysticks or conventional editing controls.

Certain engineering elements that helped to make this built-in control possible have also been incorporated into MSX.

OTHER STANDARDS OF EXCELLENCE.

While these are the computer standardizations that Spectravideo helped to initiate, they by no means represent the whole SV-318 story. This remarkable computer has also established many standards of excellence that other personal computers now aspire to:

- **Built-In Super Extended Microsoft BASIC**—Makes the SV-318 the first truly programmable affordable computer!
- **Extraordinary Memory**—32K ROM expandable to 96K, and 32K RAM expandable (via bank switching) to an amazing 256K.
- **Unparalleled Expandability**—A full supporting system of 14 peripherals, including our new ColecoVision™ Game Adapter, 7-Slot Expander Unit, Floppy Disk Drive, Data Cassette, Interface Cartridges, etc.
- **More Available Software**—Built-in CP/M compatibility gives you immediate access to over 3000 existing software programs. Plus, you can utilize Spectravideo's own fine software library.
- **Advanced Graphics Capabilities**—The SV-318 offers 16 colors in high resolution, and more importantly, 32 programmable sprites that allow tremendous control of movable screen objects.
- **Many other fine features**—Such as Z80A Microprocessor with fast (3.6) internal clock, top-loading cartridge slot, 10 user-programmable special function keys, 3 sound channels (8 octaves per channel!), low profile and attractive styling.

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BEHIND THE SCREENS

Computer Intruders, Under Thumb



The Finx 401 may help reduce criminal computer capers.

Computer raiders are the scourge of the information age. But hackers who gain unauthorized access to computerized files may have finally met their match. The developer of an extraordinary "fingerprint scanning device" claims that he has a solution that will allow institutions relying on computerized files and networking to put a lid on the electronic intrusions wreaking havoc with their systems. The manufacturer is a company based in White Plains, New York, called Fingerprintmatrix. The product is a small peripheral that hooks up to the computer and electronically scans fingerprints. The would-be user places a finger into the device and keys in a personal identification code. Only those whose fingerprints and ID codes have been registered with a particular computerized network would be permitted access to its information or services.

It all sounds like something out of a James Bond movie or an episode of "Get Smart," but, in fact, the Finx 401, as it's called, has been in development since 1976. It's been tested and approved for use by the U.S. Air Force to prevent trespass into a computer used for controlling strategic aircraft command. Also, at First Interstate Bank of California and Chase Manhattan Bank in New York City, they have been installed to prevent thefts in their electronic funds transmission services.

The device was originated to handle large systems—for instance, "(banking) situations in which the average transaction involves from a half million to a million dollars," explains Fingerprintmatrix Product Manager Rich Kjeldson. But this summer's widely publicized penetration of important computer records at the Sloan-Kettering Institute for Cancer Research in New York and a

nuclear weapons lab in New Mexico have dramatized the importance of expanding its application to prevent "raiding" taking place from the home. With computerized home banking on the rise and the use of popular telecommunications networks such as The Source growing steadily, home computer users will want to secure their own records and information against roving electronic intruders.

At about \$7,000 a piece, the devices are still prohibitively expensive. Kjeldson says that a home version is likely "to develop when the need dictates that increased volume of sales would enable us to reduce costs for the unit."

There has to be some way to prevent curious computerniks from roaming at large in records where they don't belong. Finx 401 promises to be one way for the computer industry to put the troublesome raider under its thumb.

Apples and Oranges Don't Mix

Apple Computer Company has been waging war against a different kind of alien invader—Apple-like computers advertised to run with most Apple software, imported primarily from Taiwan, and selling at half, sometimes a third, the price. (The company has already put its foot down regarding the native-born, Philadelphia-manufactured Franklin. A federal appeals court ruled in September that the makers of Franklin computers breached sensitive copyright laws by copying part of Apple's operating system into their computer's built-in memory.)

Now with the help of U.S. Customs, the company is attempting to halt the proliferation of incoming Apple "work-alikes," which go by such curious names as the Apollo, the Orange Plus Two, the Golden II, and (ironically) the Lemon. According to Karen Robinson, a supervisory import specialist with the U.S. Customs Service in Los Angeles, fakes frequently filter into the country via the mails or Europe, or are carried in directly from the Far East, by unsuspecting business people and tourists deceived by fast-talking dealers. An attorney for Apple estimated that more than 1,500 imitations have been confiscated so far.

"Typically, what happens is that someone who is traveling abroad will

spend time shopping around for goods commonly known to be sold cheaper in the East," Robinson explains. "In little back alleys there are entire rows of shops selling these counterfeit computers." With the taste of a bargain on their lips, uninformed travelers purchase the cheaper Apple work-alike, only to return home either to have their merchandise confiscated by customs officials, or finding that damaged parts are irreplaceable and unserviceable.

"Counterfeit dealers are misleading buyers," says one attorney representing Apple. "Dealers are saying that no, there's no problem with U.S. Customs." On the contrary, because Apple has registered its computer with the Customs Service, any reproductions are confiscated when detected by officials. Carriers of the counterfeits are not reimbursed. "The penalty is the confiscation," reports Robinson.

Taiwan, where most of the fakes originate, is trying to prevent exportation of these bad Apples. But according to Robinson, attempts to stem the tide of computers flowing out of the country have been largely unsuccessful.

Robinson explained that counterfeits do not necessarily resemble the original machines. It's just that they use the same operating system and machine code.

As for whether or not IBM PC, Atari, or Commodore computers also have their counterfeit counterparts, Robinson says: "There are other computers being counterfeited, but we can only enforce valid U.S. copyrights which have been registered with U.S. Customs."

"I believe the IBM PC is being counterfeited," she speculates, "because of its huge market. Anything that popular would be counterfeited."





5 COMPELLING REASONS WHY FAMILY COMPUTING MAY BE THE MOST IMPORTANT CHRISTMAS GIFT YOU CHOOSE THIS YEAR.

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CHRISTMAS IS
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FAMILY COMPUTING is a highly practical and enjoyable gift—that keeps on bringing pleasure throughout the year.

Within 10 years, the number of American households with home computers is expected to reach 30 million! That's why we created Family Computing.

Month after month, Family Computing offers useful features and articles like these...

Rating the Software • Building Your Computer Console for \$25 • The Little Computer That Could • Computer Baseball • Keeping Up with Your Children • Two Weeks at Computer Camp • Visicalc Helps You Pick a College, Plan a Trip • Care and Feeding of Your Computer • PLUS, everything you need to know about home computers.

You will receive handsome greeting cards so you can personally announce your gifts. (After December 1st, cards will be sent in your name).

1

IT'S THE PERFECT GIFT FOR ANYONE WITH A HOME COMPUTER. Family Computing, the timely new magazine from Scholastic, provides plenty of new, practical, educational, recreational, and fun ideas for using the home computer.

2

IT'S THE PERFECT GIFT FOR ANYONE THINKING OF BUYING A HOME COMPUTER FOR HOME USE. Written in plain English, this non-technical magazine will take the confusion out of the wide array of hardware and software that's available. Lots of hard-hitting detail on what's new... what's best... what it costs... and how people use it.

3

IT DELIVERS THE BENEFIT OF SCHOLASTIC. For over 60 years, Scholastic has made learning easy and fun. Today, it is a major force in teaching computer literacy. Now Scholastic closes the "computer gap" with this new magazine.

4

IT'S A GIFT OF THE FUTURE. Family Computing helps everyone develop the skills vital for this new computer age. Each issue brings new challenges and suggestions on subjects such as improving school performance... careers... home use... businesses, plus games, puzzles and fun for the whole family.

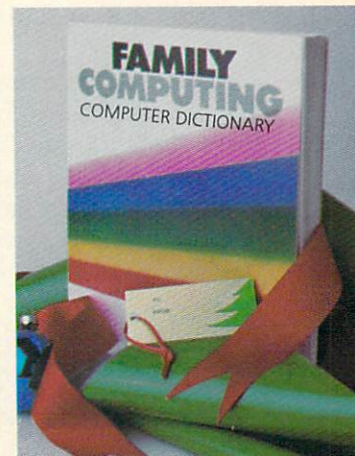
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Available only from Scholastic, the COMPUTER DICTIONARY is shipped directly to you upon receipt of payment.



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CAN A COMPUTER MAKE YOU CRY?

■ Right now, no one knows. This is partly because many would consider the very idea frivolous. But it's also because whoever successfully answers this question must first have answered several others.

● Why do we cry? Why do we laugh, or love, or smile? What are the touchstones of our emotions?

▲ Until now, the people who asked such questions tended not to be the same people who ran software companies. Instead, they were writers, filmmakers, painters, musicians. They were, in the traditional sense, artists.

■ We're about to change that tradition. The name of our company is Electronic Arts.

SOFTWARE WORTHY OF THE MINDS THAT USE IT. We are a new association of electronic artists united by a common goal — to fulfill the enormous potential of the personal computer.

● In the short term, this means transcending its present use as a facilitator of unimaginative tasks and a medium for blasting aliens. In the long term, however, we can expect a great deal more.

▲ These are wondrous machines we have created, and in them can be seen a bit of their makers. It is as if we had invested them with the image of our minds. And through them, we are learning more and more about ourselves.

■ We learn, for instance, that we are more entertained by the involvement of our imaginations than by passive viewing and listening. We learn that we are better taught by experience than by memorization. And we learn that the traditional

distinctions — the ones that are made between art and entertainment and education — don't always apply.

TOWARD A LANGUAGE OF DREAMS. In short, we are finding that the computer can be more than just a processor of data.

● It is a communications medium: an interactive tool that can bring people's thoughts and feelings closer together, perhaps closer than ever before. And while fifty years from now, its creation may seem no more important than the advent of motion pictures or television, there is a chance it will mean something more.

▲ Something along the lines of a universal language of ideas and emotions. Something like a smile.

■ The first publications of Electronic Arts are now available. We suspect you'll be hearing a lot about them. Some of them are games like you've never seen before, that get more out of your computer than other games ever have. Others are harder to categorize — and we like that.

WATCH US. We're providing a special environment for talented, independent software artists. It's a supportive environment, in which big ideas are given room to grow. And some of America's most respected software artists are beginning to take notice.

● We think our current work reflects this very special commitment. And though we are few in number today and apart from the mainstream of the mass software marketplace, we are confident that both time and vision are on our side.

▲ Join us.

We see farther. **ELECTRONIC ARTS™**





TO LEARN MORE about our growing number of titles—and to receive a free poster of the artists pictured here—stop by your favorite computer store or software center. If you need help finding the Electronic Arts dealer nearest you, write us at 2755 Campus Drive, San Mateo, California 94403 or call (415) 571-7171.

SOFTWARE ARTISTS? "I'm not so sure there are any software artists yet," says Bill Budge. "We've got to earn that title." Pictured here are a few people who have come as close to earning it as anyone we know.

■ That's Mr. Budge himself, creator of **PINBALL CONSTRUCTION SET**, at the upper right. To his left are Anne Westfall and Jon Freeman who, along with their colleagues at Free Fall Associates, created **ARCHON** and **MURDER ON THE ZINDERNEUF**.

● Left of them is Dan Bunten of Ozark Softscape, the firm that wrote **M.U.L.E.** To Dan's left are Mike Abbot (top) and Matt Alexander (bottom), authors of **HARD HAT MACK**. In the center is John Field, creator of **AXIS ASSASSIN** and **THE LAST GLADIATOR**. David Maynard, lower right, is the man responsible for **WORMS**.

■ When you see what they've accomplished, we think you'll agree with us that they can call themselves whatever they want.

Choose Educational Software the Way They Do

Can a computer in the home live up to all the boasts of manufacturers? Can a microcomputer serve as a storehouse of knowledge? Can it really enable families to discover new solutions to old problems and educational opportunities they hadn't imagined? Can it help children get better grades, provide a wonderful tool for helping with homework and writing term papers, and make it easy to pick up a foreign language or even write home-grown computer programs?

You bet! Don't doubt those advertising claims. A computer in your home can be transformed into a valuable educational tool for anyone from preschoolers to grandparents—when outfitted with high-quality educational software. But, where does the family with a toddler ready to identify colors, a six-year-old beginning reader, a junior high math nut, or a college-bound high school student find the best educational software? Good educational software for all ages and abilities does exist, but you'll have to do some homework to find it.

Most local computer stores carry only five or six different lines of educational software at most, but a

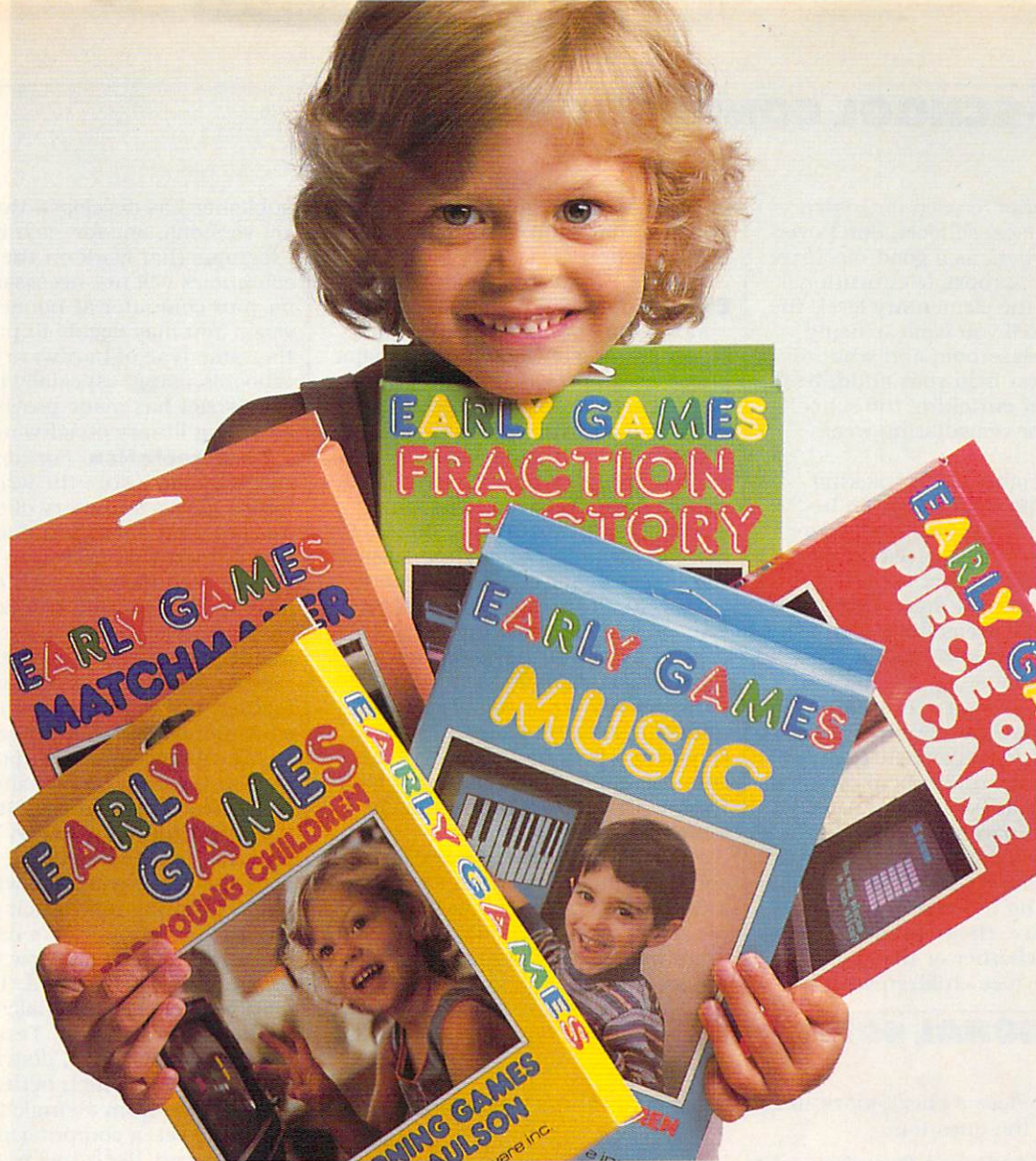
MINDY PANTIEL *and* BECKY PETERSEN, *now partners in a communications company, have between them experience in journalism, education, and computers. They are contributors to Teaching and Computers and Electronic Learning (both published by Scholastic Inc.).*



quick examination of the most recent *School Microware Directory* reveals that as many as 200 manufacturers now have 2,000 educational software packages currently on the market. In order to effectively discern the good from the bad, take a lesson from the teachers in your schools. Follow their example in finding and then judging the merits of educational software packages.

Begin by looking at in-depth reviews of educational software written by objective reviewers, preferably individuals with educational creden-

tials and computer classroom experience. If you want to go beyond reviews in a consumer publication (such as FAMILY COMPUTING), your school district reference book collection should include such educational publications as *School Microwave Review*, *Courseware Report Card*, *MicroSIFT Reviews*, or *EPIE Micro-Courseware PRO/FILES*. Or you could encourage your public library or local computer dealer to place a subscription to at least one of them. You might also want to consult an educational computing magazine, such as *Electronic Learning* or *Teaching and Computers* (both published by Scholastic Inc.).



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There are five programs in the Early Games series. **Early Games for Young Children** is a set of nine entertaining activities for children 2½ to 6. They can work with numbers and letters and create colorful pictures. **Matchmaker** uses shapes, sizes, directions and

colors to help children develop reading readiness skills. Children ages 5 to 12 can learn to play melodies with **Early Games Music**. **Piece of Cake** turns math problems into, well, a piece of cake. And **Fraction Factory** takes the work out of fractions.

Early Games feature multiple activities, easy to use picture menus, and colorful graphics. The games are fun, children love to play them! That's why they learn from them.

And that's the best reason for having a home computer.

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HOME-SCHOOL CONNECTION

If computers are used for instruction in your local schools, don't overlook the teachers as a good resource for locating appropriate educational software. At the elementary level, the teacher can tell you what is being used in the classroom and what to look for to best help your child, be it reinforcing or enriching the school curriculum or remediating weaknesses.

In junior high school, tracking down this type of information becomes more difficult because computer applications vary widely depending on the subject area. Get teenagers to narrow down their interests or weak areas first; then ask teachers of those subjects for their recommendations.

Whether your source of information is a local computer store, a published review, or a teacher, the next step is to determine if the package is worth the dollar investment. Just like teachers, parents need to become informed educational software evaluators. They face the same situation in judging the merits of educational software, the bottom line always being whether or not the program provides children with a

valuable, well-designed learning experience that utilizes the power of the computer.

EDUCATORS' STANDARDS

Most educational software is designed for one of the following major purposes: to provide drill-and-practice of basic skills; to introduce a subject to a learner through a tutorial program; or to model real-life situations through simulations. A fairly new category, referred to as "fun learning" software, allows students more freedom to explore and learn at the same time and is generally less formal. In all cases, the important issue is whether learning is enhanced by use of the computer.

Let's take a look at some standards used by educators to determine if a software package being considered is of high quality. Parents can apply these standards effectively with a few modifications for home use.

Hardware Requirements. If the software you are about to consider has not been designed for the computer you have, keep looking. A program written for the Atari 800 will not work on the Apple IIe unless the

publisher has developed two different versions, one for each machine. Programs that work on the school's computers will not necessarily work on your computer at home and vice versa. You may decide to purchase the same type of hardware the school is using, especially if your local district has made provisions for a lending library of software.

Documentation. For home use, check to make sure the written materials have a summary of the various program options and an instruction section that takes you step-by-step through each one. Complete documentation should also include sample screens and commands, as well as a troubleshooting section. Teachers will go one step further, looking for more complete educational goals and objectives, a technical section, and support materials in the form of worksheets and suggested classroom activities.

Educational Validity. You will find that most educational software packages come complete with a sales pitch, claiming how much children love the program. That's not enough. Check to see how well the program has been tested. This information, if it exists, usually appears in the documentation. Test data from an entire school district or several districts is much better than rave reviews from a single teacher or, worse yet, a computer programmer who very likely has no background in education.

Content. In some ways, buying software for children is similar to choosing a game or a book. First and foremost, you need to make certain that the software is written at an appropriate age and grade level for your youngster. For example, software for young children that presents a large amount of printed instruction on the screen would be inappropriate for that age level. And some educational packages claim to meet the needs of an extremely wide range of ages. Be skeptical of software that says it can be used from first grade through high school. A program that is too difficult or a reading level that is too advanced for young children will only lead to frustration and confusion. And with an older child, a program that offers no challenge or that progresses too slowly will bring about boredom, and chances are it won't be used.

Presentation. Good educational programs should have clear instructions both at the beginning of the

EDUCATIONAL SOFTWARE TEST

Directions: Place a check mark in the box that you think best answers the question.

Yes No Hardware Requirements

- ☐ ☐ Will this software run on our computer?

Yes No Documentation

- ☐ ☐ 1. Is each program option summarized?
☐ ☐ 2. Are step-by-step instructions included for each option?
☐ ☐ 3. Are sample screens and commands used to illustrate how the program works?
☐ ☐ 4. Is a troubleshooting section included?

Yes No Educational Validity

- ☐ ☐ Has the program been tested and validated widely?

Yes No Content

- ☐ ☐ 1. Is the program written for the age and grade level of my youngster?
☐ ☐ 2. Is it challenging without being too difficult?
☐ ☐ 3. Does it blend with the school curriculum?

Yes No Presentation

- ☐ ☐ 1. Are the beginning instructions clear?
☐ ☐ 2. Are additional instructions included on each screen?
☐ ☐ 3. Is a cursor used to tell when and where to answer?
☐ ☐ 4. Are the computer responses nonjudgmental and patient?
☐ ☐ 5. Can the child get help if needed?

Yes No Motivation

- ☐ ☐ 1. Are the graphics fun?
☐ ☐ 2. Do they motivate rather than distract?
☐ ☐ 3. Is sound used only in a positive way?
☐ ☐ 4. Are games nonviolent?

THEY CALL HIM "NUMBERS" GANS.

Name: Jason Gans
Age: 12
Home: Belvedere, California
School: Del Mar
Hobbies: Piano, tennis, sailing,
programming
Ambition: To be an artist
Favorite
software: Math Maze™
by DesignWare



"Math Maze is neat because you do more than just add and subtract numbers all the time. You've got to find them first. And then get there before you get caught."

"It's got real good graphics. I can even change the background color. And make the math as challenging as I want."

"There's lots of mazes, too. But the best thing is, I can make up my own. So when my friends come over, I've always got something new."

DESIGNWARE ON CREATIVITY.

Children learn the most through creative problem solving. That's why *Math Maze*, like so many DesignWare games, is an open-ended exercise that challenges and nourishes young minds. In a way that's a lot of fun.

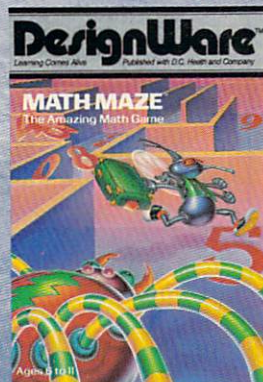
DesignWare programs encourage kids to draw on something they just happen to have an unlimited supply of—imagination!

SPELLING, MATH, OR LANGUAGE Games like *Math Maze*, *Spellicopter™* and *Creature Creator™* inspire youngsters to tap into that fertile idea-field. To actively become part of the program, in effect creating "new" games as they go along. And all the while building up solid skills in the basics. And all the while having a lot of plain old fun.

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As Jason Gans says, "Hey—they don't call me 'Numbers' for nothing, you know!"



DesignWare™

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HOME-SCHOOL CONNECTION

program and along the way. Youngsters do not always assume that they should "press the space bar to continue" and they easily forget how to exit a program or select a different option unless reminded frequently. A cursor should be used to indicate when the computer is waiting for a response and where it should appear. Instructions should also be simple, yet complete enough for a child to be able to run the program alone once parents have helped with an introduction and a practice run through or two.

When it is the computer's turn to give a response, that message should always be nonjudgmental, friendly, and patient. A child should have the option to seek help if he or she is struggling with a question, and rewards for correct answers should be exciting, though not distracting.

Motivation. This is the fun part. Educational software is filled with captivating graphics, bells and whistles, and flashing colors and rewards. Just make sure that such devices, besides being fun, serve some educational value. Graphics and colors should appear on the screen quickly so that they motivate rather

SOURCES OF EDUCATIONAL SOFTWARE REVIEWS

Courseware Report Card

150 West Carob St.
Compton, CA 90220

Electronic Learning

730 Broadway
New York, NY 10003

EPIE Micro-Courseware PRO/ FILES

EPIE Institute
P.O. Box 839
Water Mill, NY 11976

MicroSIFT Reviews

Northwest Regional Educational
Laboratory
300 S.W. Sixth Ave.
Portland, OR 97204

School Microware Reviews


Dresden Associates
Box 246
Dresden, ME 04342

Teaching and Computers

730 Broadway
New York, NY 10003

than distract, and sound, if used at all, should not be used to signal an incorrect answer. Calling attention to a wrong answer is upsetting to children, especially if others are listening.

Well-designed game formats serve as great motivators for children, providing opportunities to improve speed and accuracy through drill-and-practice and to solve problems through simulations. Parents may want to make sure, though, that the games are nonviolent and that they foster individual self-improvement rather than competition.

Because many of the software packages that provide good computer-learning experiences for children at home are the same as those being used in classrooms, these educational standards developed by teachers can be put to good use by parents. Remember that good educational software should be easy for children to understand and operate without a great deal of adult supervision and, of course, be well matched to the child's age and grade level. It should be well tested and validated, but fun and challenging, too. Use the checklist on p. 22 to see if your choices make the grade. 

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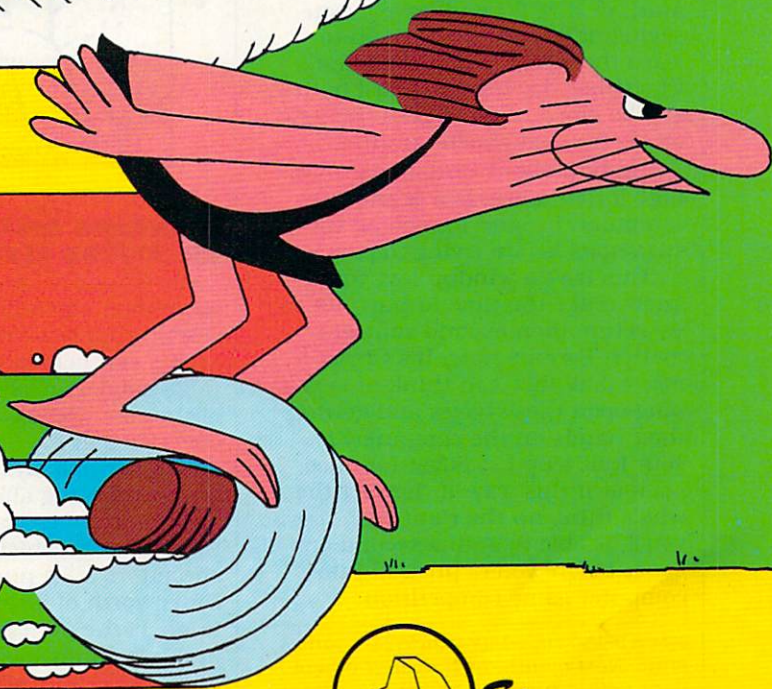
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GAMES

MORE POPULAR THAN THE PUNCH BOWL

Computer Games and the Spirit of Christmas

BY JAMES DELSON

"Tis the Season to Be On-Line"*

*Tis the season to be on-line,
Get computerized, you won't be
sad.*

*Boot a game up, you'll do just fine,
Learn about it now, and you'll be
glad.*

*Timex-Sinclair or Atari
IBM, Commodore, Apple, too,
Texas Instruments and others
Get a bunch of bytes,
you won't be blue!*

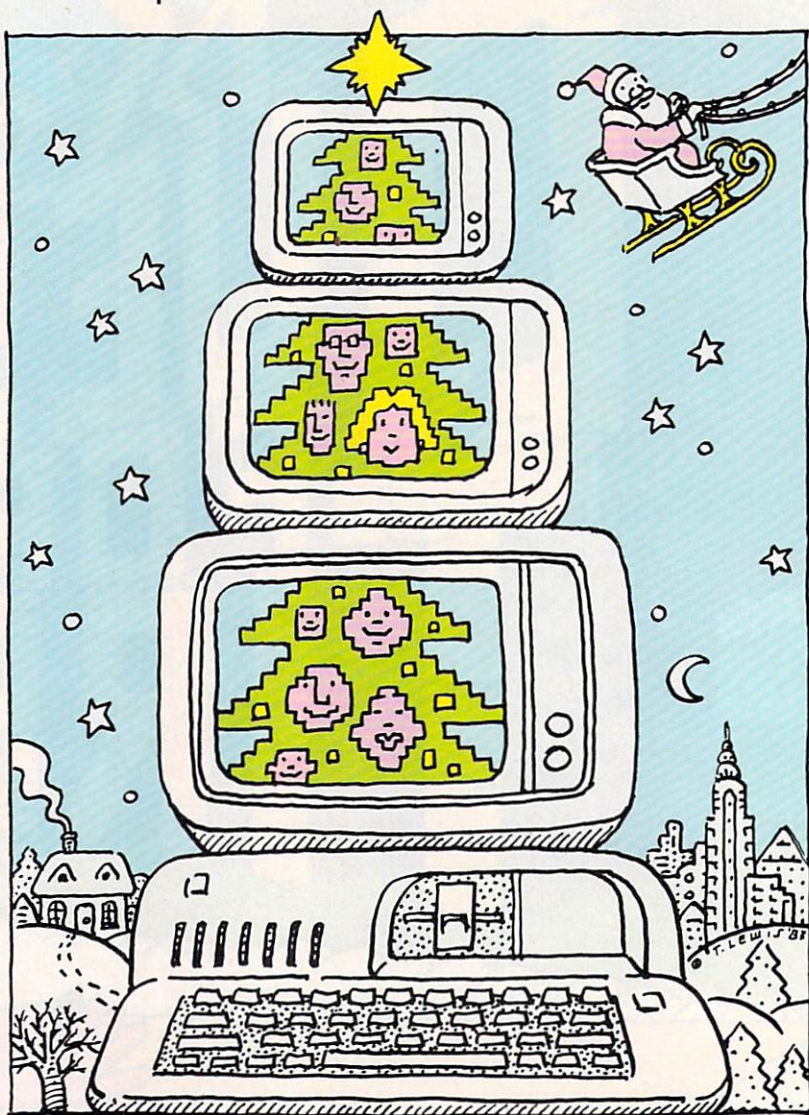
It's always a real challenge waiting up all night for Santa. Christmas after Christmas there is the same old stuff on TV: movies you've seen a dozen times, sitcom repeats you never really wanted to watch the first time around.

No matter what you do, no matter how hard you try, you eventually nod off before Señor Kringle arrives. And in the morning you wake up to discover that he did eat the milk and cookies you left for him, but never bothered to wake you up and say thanks. He just left the loot and took off. Well, here's the foolproof plan to make old St. Nick stick around: boot up a classic computer game like *Temple of Apshai* on your Apple, Atari, or IBM PC and leave a note saying he'll have to wake you to learn the rules. No doubt, when Christmas day breaks, you'll both still be glued to the screen, fending off beetles and ghostly wraiths.

And how about Christmas morning? If Santa brings a brand-new computer, be sure to read all the instructions before trying to play with it. This isn't a windup toy, you know. Take the time to learn its basic setup, then expand your gray matter. Parents note: It's Christmas—if all they can think of is ripping open those boxes and getting their hands on the computer, let your kids skip breakfast for once. Look at it this way: if they set the whole thing up the right way, maybe you'll be able to grab a second cup of coffee before you're pressed into computer game competition.

JAMES DELSON is FAMILY COMPUTING's games critic. Next month, he'll open the new year with a rundown of his favorites.

*Sung to the tune of "Deck the Halls."



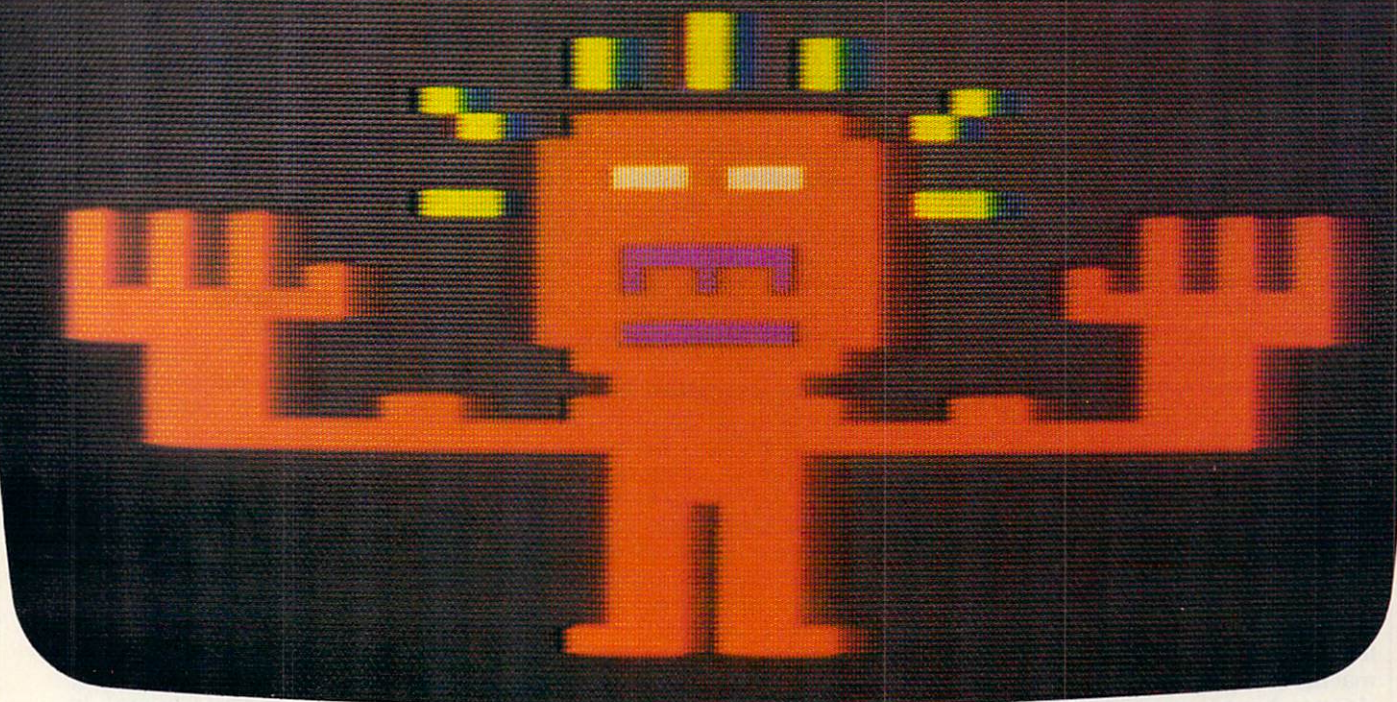
BRINGING DISTANT RELATIVES CLOSER

Christmas is family time—perhaps more than any other time of the year. If they're properly used, computers can help make this a memorable holiday involving all members of the clan. Regular playing sessions conducted at my house on weekends and lesser holidays are always collective, compelling affairs.

Playing games, especially interactive games in which players and spectators alike pitch in their two cents worth of ideas and suggestions, is the perfect icebreaker in multiple family-member situations. People who were strangers one moment wouldn't think twice about clapping each other on the back af-

ter having put their wits together to construct a set of wings from seemingly unrelated objects, as players do in the graphic adventure game for Apple, Atari, and IBM PC computers, *Ulysses and the Golden Fleece*. Distant cousins, with whom you've rarely conversed, much less competed, but who always show up for the holidays, could be candidates for a rousing game of *River Raid* for the Atari. Invite them to join you in piloting a jet fighter in close combat, nailing enemy ships, and shooting down attacking tanks and helicopters. You'll find it more popular than the punch bowl.

The squirms that accompany Great-Aunt Esme's fifteenth annual retelling of an old family tale might



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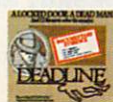
Step up to Infocom. All words. No pictures. The secret reaches of your mind are beckoning. A whole new dimension is in there waiting for you.

(For more information on Infocom games contact: Infocom, Inc., P.O. Box 855, Garden City, NY 11530.)

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GAMES

finally subside as you engage the old storyteller in an enthralling text adventure. Just ease her down in front of your computer screen and introduce her to *Wizardry*. She may balk at the idea of creating her own game character. She may pooh-pooh the prospect of reasoning her way through a whimsical riddle. But once she's hooked, as everyone is who tries these superb programs, giggles of delight will certainly replace stifled yawns as the family becomes involved in the achievement of a shared goal. Togetherness and comradery are natural by-products of adventure gaming.

The only complaint you may run up against is going to come from the kids, who'll complain that the old folks are monopolizing the family machine. Give them their due, even if Great-Aunt Esme has just made sixth level as a mage. Surely they'll let her play along when they descend into the dungeons of *The Sword of Fargoal* for the Commodore 64 and VIC-20, climb the world's greatest mountains in *Alpiner* for the TI-99/4-A, or run for office in *President Elect* for the Apple. And instead of having to sit through the same old song and dance about how much they've grown, by example of their expanding powers of reasoning, they can show the relatives just how much they've learned.

SIX OR EIGHT CHAIRS, A POLICEMAN, AND NO SODA

In preparing the house for Christmas season gaming, it's a good idea to set aside a room with space for six or eight chairs, with a table or other surface nearby for food and drinks. Anything edible or potable in the vicinity of the computer is strictly verboten. Nothing demolishes the fun as quickly as the dread "Soda syndrome." "Oops, I'm sorry" doesn't make up for wrecked equipment. Make sure that whoever is responsible for the care of the computer acts as a police officer. No matter how often people swear they'll be good, someone is going to forget and bring along that half-filled can of soda or half-eaten morsel of fruitcake. Although unpopular at first, the family Scrooge will minimize the risk of catastrophe.

The extra chairs in your holiday computer room may be empty when the gaming begins, but they'll be filled in short order as strangers to this phenomenon realize what they've been missing. Computer

FAMILY COMPUTING CHRISTMAS SHOPPING LIST

FOR BEGINNERS AND BEYOND:

Alpiner, Ages 4+; available for TI-99/4A; [see *Software Guide*, p. 166].

Crush, Crumble and Chomp! Ages 10+; available for Apple II/II plus/IIe; Atari 400/800/1200; Commodore 64; TRS-80 Model I (level 2)/III; Epyx, 1043 Kiel Ct., Sunnyvale, CA 94089; (408) 745-0700.

Pinball Construction Set, Ages 12+; available for Apple II/II plus/IIe; Atari 400/800/1200; Electronic Arts, 2755 Campus Dr., San Mateo, CA 94403; (415) 571-7171.

President Elect, Ages 12+; available for Apple II/II plus/IIe/III; Strategic Simulations, 883 Stierlin Rd., Bldg. A-200, Mountain View, CA 94043; (415) 964-1353.

River Raid, Ages 6+; available for Atari 400/800/1200; [see *Software Guide*, p. 166].

Sword of Fargoal, Ages 10+; available for Commodore 64/VIC-20; [see *Software Reviews*, p. 178].

Ulysses and the Golden Fleece, Ages 12+; available for Apple II/II plus/IIe; Atari 400/800/1200; IBM-PC; [see *Software Reviews*, p. 180].

Wizardry, Ages 10+; available for Apple II/II plus/IIe; IBM-PC; Sir-tech, 6 Main St., Ogdensburg, NY 13669; (315) 393-6633.

FOR INTERMEDIATE AND ADVANCED PLAYERS:

Archon, Ages 12+; available for Apple II/II plus/IIe; Atari 400/800/1200; Commodore 64; Electronic Arts.

The Road to Gettysburg, Ages 12+; available for Apple II/II plus/IIe; [see *Software Reviews*, p. 178].

Sammy Lightfoot, Ages 10+; available for Apple II/II plus/IIe; Commodore 64/VIC-20; Sierra On-Line, Sierra On-Line Bldg., Coarsegold, CA 93614, (209) 683-6858.

Temple of Apshai, Upper Reaches of Apshai, Ages 10+; available for Apple II/II plus/IIe; Atari 400/800; IBM PC; [see *Software Reviews*, p. 180].

Zork I, II, and III, Ages 12+; available for most machines; [see *Software Guide*, pp. 166].

FOR THE ADVANCED AND MORE ADVENTUROUS:

Flight Simulator, Ages 12+; available for IBM PC; Microsoft, 10700 Northrup Way, Bellevue, WA 98004; (206) 828-8080.

Knight of Diamonds and Legacy of Llylgamyn, Ages 12+; available for Apple II/II plus/IIe; IBM PC; Sir-tech.

sales figures are going to rise before Christmas—that's expected. But the potential for new converts during the holiday season is waiting to be tapped. Wait to see the January sales figures.

'TIS THE SEASON TO BE ON-LINE

Unlike television, computers make reasonably good companions. They offer the chance for kids (and adults) to exercise the cerebral cortex, not just send it out for lunch. Show me a kid who won't choose *Sammy Lightfoot* or *Archon* over reruns of "Mission Impossible," and I'll eat my disk drive. Of course, computers make terrific parent sitters, as well. Sisters, cousins, and aunts are all guaranteed to fall for the highly playable and constantly entertaining *Crush, Crumble and Chomp!*, in which players assume the role of a famous movie monster, or *Pinball Construction Set*, in which you design, build, and modify your own electronic pinball table.

If you're giving games, by all means, don't guess which ones your loved ones will want. That point can't be emphasized enough. Surprises are nice, but this is a very specialized market. Each gamer has his or her druthers, just as each game has its own flavor and feel. It's too easy to go wrong when there are more useless games out there than good ones.

Often, you'll be able to match a close one's interests or hobbies with a suitable game. Greek mythology buffs will enjoy *Ulysses and the Golden Fleece*, while aspiring aviators and dreamers will get a kick out of Microsoft's *Flight Simulator* for the IBM PC. Would-be seafarers will love to set sail with Strategic Simulations' new *Broadside*, a complex game for the Apple in which players select or build a warship of their own and set sail in 18th-century seas.

If you're a computer game giver or taker and you don't know where to turn, this list of tried and true games may help you out. Many have been reviewed in this and previous issues of *FAMILY COMPUTING*. You may be able to try out some of them at your local computer store. Not every shop owner will let you, but it's worth a try and it may save you some money and hurt feelings.

A parting wish: May your mind be lucid and bright, and may all your programs boot just right! ☐

GIVE YOUR KIDS A LESSON THEY'LL NEVER FORGET.



When kids have fun and learn at the same time, they're more likely to remember more of what they've learned. What's more, when they associate the two together — learning becomes an enjoyable activity. So they'll do more of it.

That's the basic principle behind the Learning Fun Series from EPYX.

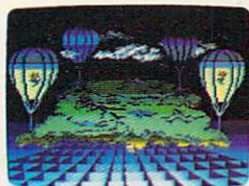
FUN WITH MUSIC. PARENTS TAKE NOTE.

Fun with Music™ is designed to appeal to both you and your children. It comes with a songbook and has two modes of play. In the first mode, you can enter songs from the songbook — or compose your own. Then

play the songs back, adding or removing notes and changing tempo or key. Your computer is like a musical instrument with memory, and you see every note of it displayed on your screen.

The second mode lets you play your song in a fun-filled action game. You control a drum major trying to touch the notes before a small but pesky poodle catches up to him and slows down the parade.

Either way, Fun with Music gives you and your whole family the perfect mix of learning and play.



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Creating art on the video screen is one of the newest forms of "high-tech" play for kids. And adults, for that matter. Plus there's nothing to clean up afterwards.

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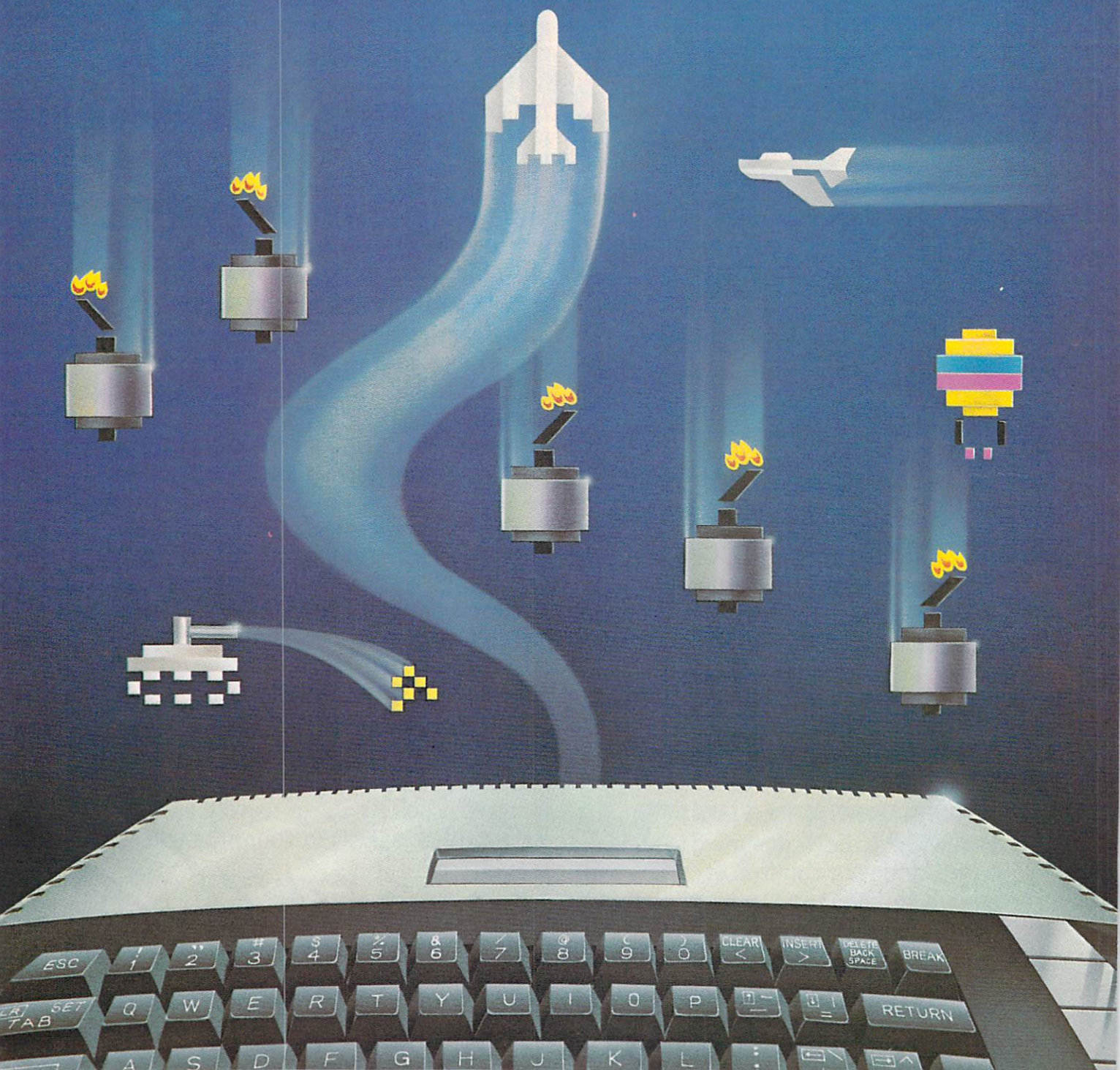
Fun with Art brings out the artist in you, no matter what your age!

MORE LEARNING FUN ON THE WAY.

These two are the first of an extensive series of Learning Fun games we have planned. Look for these, as well as other EPYX titles, wherever computer software is sold.

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And if you're up to it, now you can skip easier sections of the river and get right to the heart of the battle.

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To the ever-quickenning pace of the 1812 Overture.

You shift right. Left. Back again. All the way right.

He misses! You win!

Now it's your turn to catch. The pressure mounts.

The bombs start flying. You dash to catch them.

And so it goes on into the night.

And everytime you hit a new high score, it's displayed after the game, just like at the arcade.

Kaboom! and River Raid for your Atari home computer.

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HOME BUSINESS

GIVING UP the 9-to-5 SHIFT For a Successful Home Accountant Business

BY JEREMY SCHLOSBERG

A shiny blue '57 T-Bird cruises down the main road in Spencer, New York; it seems to be the street's newest object. Planted in the midst of Tioga County farmland, Spencer—with its worn storefronts and idiosyncratic wood-frame houses—appears to a visitor as a town lost in time. Never mind Spencer's one supermarket and solitary bank; were you to discover that residents here were still pumping their water out back and reading by gaslight, you might not be too surprised.

Follow the T-Bird till the road ends, then take a left. See the saw mill on the right? Across from that is the Wild house. Has been since 1905. Inside is a curious mixture of the expected—a wood-burning stove that heats the house in the winter, antique family heirlooms on display—and the unexpected. There, in a chamber off the dining room, sits Donna Wild's TRS-80 Model II computer, dot-matrix printer, and Xerox copier.

Since October of 1982, Donna has been running an accounting business from that little room. Calling her operation Computer Connection, Donna specializes in bookkeeping for small local businesses. She started Computer Connection with one client and a bank loan for a computer. A year later, the business is bursting out of its original office, with the demands of more than 25 clients—ranging from a chain saw sales and repair shop to a small local heating oil company. For over three quarters of her clients, Donna does all the bookkeeping—from balancing checkbooks to generating income statements that tell businesses whether they are making or losing money. The rest of her clients use Donna for specific services, such as

payroll or income tax returns.

Not bad for a woman whose prior attempt to launch an accounting business ended in failure eight months later. That was in 1980. Donna had just received an accounting degree from a local community college. Confident, personable, and dedicated to her skills, she established a home business, only to find it painfully frustrating. "I was so limited by the number of people I could serve," she remembers, "that I decided I might better go to work for someone else." And in the spring of 1981 she did, getting a job as a full-time bookkeeper for one of her clients.

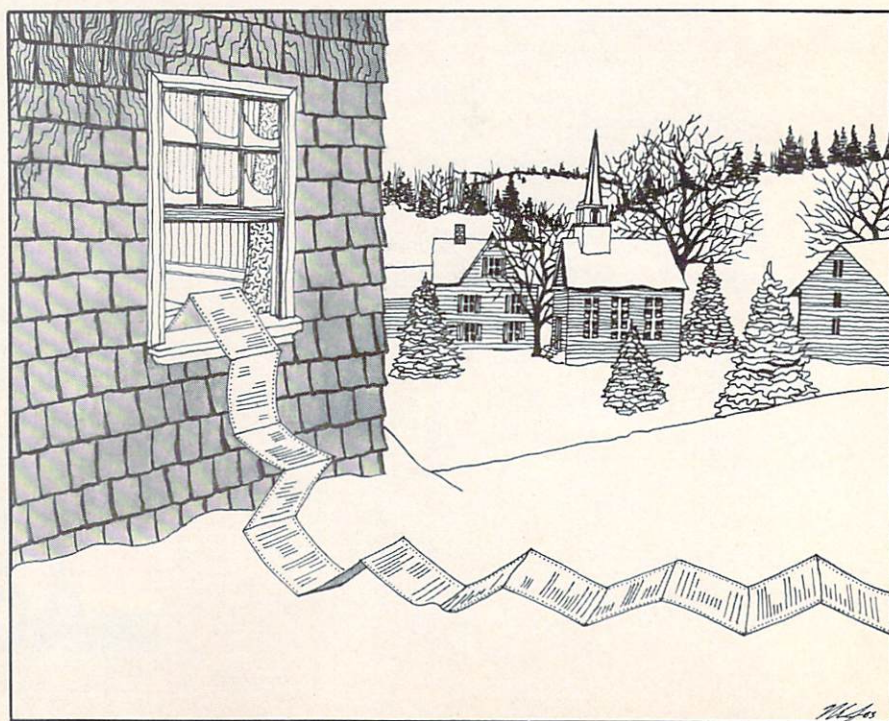
THE COMPUTER DIFFERENCE

Still confident, personable, and dedicated, Donna now commands a thriving business. The difference between her current business and her old one? The number of clients she can handle at once. The reason? That anachronistic addition to the

Wild household—Donna's personal computer.

As a full-time bookkeeper Donna discovered the machine that would free her to work for herself. In February of 1982, when her boss purchased a TRS-80 to handle the office's payroll chores, Donna became excited by the possibilities she saw in computerized accounting.

"The computer," says Donna, "is the most fantastic thing that has ever happened to accounting." Accounting, for the uninitiated, involves the perpetual entering and manipulating of numbers in an array of different bookkeeping documents. Sales are recorded into a ledger, expenses into a journal; together, the figures proceed to a general ledger, from which the accountant calculates a trial balance. This done, income statements and balance sheets can be drawn up. "Each one of those times," says Donna, alluding to traditional pencil-and-paper accounting, "you're re-



JEREMY SCHLOSBERG is a free-lance writer living in Ithaca, New York. He is editor of *Q* magazine, a small alternative biweekly in Rochester, New York, and is a regular contributor to *Upstate* magazine.

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HOME BUSINESS

writing those numbers by hand. With a computer, you put them in once—the income statement is generated automatically once the individual statistics are entered.” Just by pressing a button.

“Even on a small company’s books, the computer cuts out two or three hours of work,” Donna says. Days, she says, can be saved on a big job.

Beyond sheer speed, accounting by computer offers unparalleled accuracy. Paper ledgers can conceal one mistaken figure in a sea of numbers. A computer ledger, on the other hand, demands balance with every single entry; a user can never proceed when the debit and credit columns are not equal.

Having had little previous computer experience, Donna is a testament to the power of mind over matter. “I am not a technical person,” she freely admits. “The computer is nothing but a glorified tool,” she stresses. “You can do whatever you want with it.”

What Donna wanted was her own business; in the computer, she knew she had found a valuable associate.

LAYING THE GROUNDWORK

By the summer of 1982, Donna had handed in her resignation, giving herself ample time to buy her computer and software before leaving her job for good at the end of September. Her experience with and good feelings about the TRS-80 led her to choose it as the machine for her own office.

A Radio Shack computer center in Binghamton, 45 miles away, provided Donna with the ideal computer-shopping environment. “I would go in there and sit down with them,” she recalls, “and they would spend hours with me. They’d put a program up on the screen and say, ‘Here, play with it for a while.’ In a couple of hours you can’t really find out a lot, but you can see whether or not it’s going to run for you.”

As Donna spent the end of the summer of 1982 familiarizing herself with her new equipment, she also began to lay the personal groundwork for her new business.

Since large, established businesses usually already have accountants, Donna set her sights on new, small businesses. She knew that most people who start new businesses are bound to visit bankers, for capital, and lawyers, for logistical particulars. Donna’s course was clear.

“I got a large supply of business

cards and gave them to bankers and lawyers in the area. I said, ‘Look, you all know me. You know that I do a good job. I’d appreciate it if you recommended me.’ And they did.” It pays to use connections, and in a town like Spencer (population about 2,500), Donna Wild, a resident since 1960, had a lot of them.

To promote her new business to the public, Donna took out advertisements—both in the Yellow Pages and in a couple of small local papers. Those and an initial two-week period spent talking in person to anyone and everyone she could, have been all the self-promotion she’s had to do.

SUCCESS FROM THE START

Computer Connection got off to a nice, steady start, averaging two new clients a month from October of 1982 through April of 1983. After that, says Donna, “It just started snowballing.” Since this spring, she’s been averaging four to five new clients a month. Business grew so

terrifically that she found herself unable to handle everything alone, computer or no computer. This past summer, she hired someone part time to input data.

From the beginning, Donna has been buying her software one program at a time, in response to growing needs. She uses the TRS-80 business programs; beginning with *General Ledger*, she now has *Payroll* and *Accounts Receivable*, each purchased to handle specific tasks for specific clients of hers.

Even as an accountant, however, Donna finds that her most utilized piece of software is not any of the business packages but her *Profile II+* data-base program. She compares it to a blank piece of paper “that you can write on, and add, subtract, divide, and multiply on.” Donna uses *Profile* for inventory and for municipal accounting, as an expandable filing cabinet for client data and as an endlessly manipulable mailing list. To her, the possibilities are limitless. →

TIPS FOR STARTING YOUR OWN HOME ACCOUNTING BUSINESS

You cannot start a computerized bookkeeping business without an accounting background. But you can get one going with little or no experience with computers. Here are seven steps to guide you:

1. Brush up on your accounting—all of it. “You’ve got to know how to do everything up through the tax return,” says Donna Wild. Take courses if necessary to strengthen any of your weaker areas.

2. Don’t be intimidated by expense. Sure, these machines cost a lot; a bank, however, might be interested in helping you out. Tell your banker what you want to do, explain how much you’ll need, and demonstrate how you’ll pay it back—on paper. “If you’ve got good credit,” says Donna, “it can be started on a shoestring.”

3. Equipment first, clients second. You have to be familiar with what your computer and software can do, because it’s the first thing potential clients will ask you. Donna suggests having your computer and your programs for at least a month before you go public.

4. Don’t expect to master your software quickly. Most accounting programs will take a solid

40 to 80 hours to learn. Don’t cut corners—take one step, read it, do what it says, and understand it before you go to the next step.

5. Advertise. Get your name out there consistently. Donna advertises in the *Yellow Pages*, and weekly in local papers. If people see your name week in and week out, says Donna, “they’ll get the idea that your business isn’t a fly-by-night operation.”

6. Be as thorough with your own plans as you are with your clients’ books. Continually research software for advancements and developments. Nearly every major brand of personal computer has its own magazine these days; this is the best place to start your research. Maintain a working relationship with the store in which you purchased your computer—the salespeople there can often keep you informed about new and improved software.

7. Your machine’s a machine—you are a person. Keep it that way. A good deal of what an individual accountant can offer is personalized service; in the end, people will hire you not for your silicon chips but for your skills and quality of service. —JEREMY SCHLOSBERG

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here," she adds, "and that's one of the things my clients like. They come here and we put on a pot of coffee, sit down at the dining room table, and talk."

Donna is in contact with her clients as each case demands. "My biggest clients I'll talk to weekly," she says. "And I'd say I talk to 80 percent of my clients once a month."

Donna's family—her husband and four children—has backed her all the way with Computer Connection. Her youngest boy, who is 14 years

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old, even has a plan. "He keeps telling me he's going to go to college, come back, take my business over, and make me a millionaire," she chuckles. "He doesn't think accounting, he thinks computing."

As for husband, John, he's "very interested and supportive," though Donna admits that he doesn't express that much direct curiosity about her computerized business. What does he do? "He's in quality control at IBM," reports Donna.


Oh, so he's already familiar with computers.

"No," laughs Donna, shaking her head. "He's never used one." As it turns out, he works on IBM's federal projects, and has little to do with computers per se.

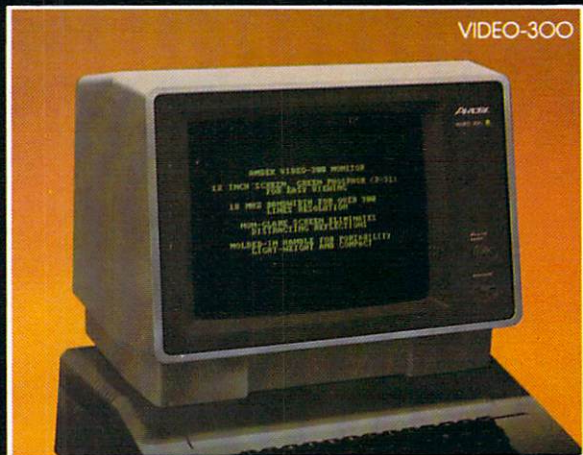
Unlike his ambitious wife, who is planning some big things for the next few years. "I have very strongly been thinking about franchising," she says. She's already been helping people informally: "I have probably had a hundred phone calls from people in the surrounding areas who have seen my advertising, and have said 'How did you do this?'"

"I see the market for a lot of these businesses," she says. "Maybe I would start by offering classes, and grow from there." Ultimately, she envisions Computer Connections all over: independent accounting businesses that she sets up, provides equipment for, services when necessary—in return for a percentage of monthly sales.

"There are franchises that are big corporations, yet the name says quality. That's the one thing I would preserve. If you give people the personal service and the respect they deserve, then your services are going to be in demand."

"I want to get big," says Donna Wild. "But I'm never going to lose that personal touch. That's an attitude more than anything else." And that attitude can't be taught. 

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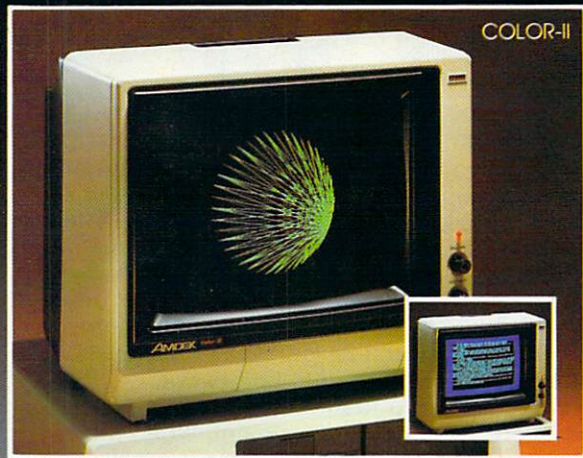
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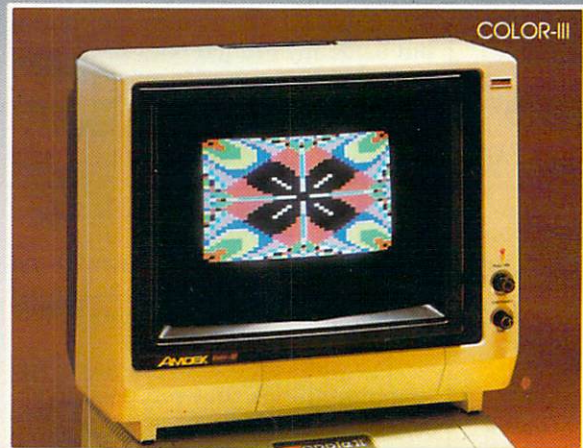
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ADDICTED TO COMPUTERS

BY SARAH KORTUM

Jonathan Franklin first saw the school computer room on a tour with his math class. Only weeks before the 14-year-old freshman had left family and friends 3,000 miles away in San Francisco for boarding school in New Hampshire. "I don't think the computer room caught my eye at first," recalls Jonathan, now 17. "I didn't say, 'Gosh, this is where I want to spend the rest of my life!' " But it was where he ended up spending most of his winter.

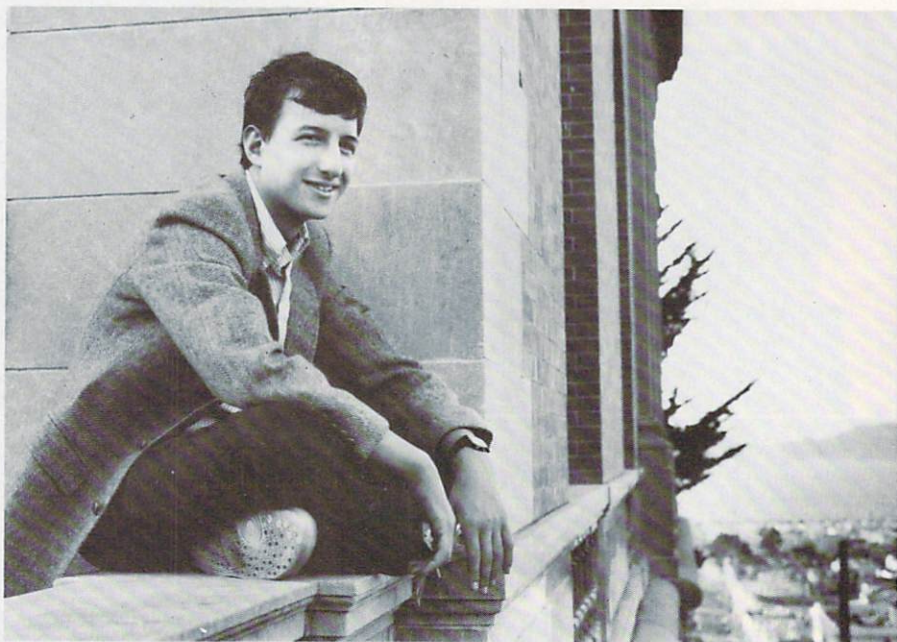
Only 5'1" and 98 pounds at the time, "I really looked like some sort of young, new person there," recalls Jonathan, who has since shot up to 5'11". "I wore glasses—they weren't wires, they were sort of gray plastic. I was the only ninth grader on a [dorm] floor of all seniors and juniors. They all liked to abuse me because 'Here's this little guy.'"

"I wasn't shy and embarrassed," Jonathan continues. "I was very loud on the outside. I did a lot of wandering through the dorm, making a nuisance out of myself. I always tried to make bad jokes. I lacked the ability to communicate with people, the ability to really sympathize with people. I just wasn't very personable. I was solitary in the sharing of my feelings and understanding how other people felt."

"Often in a new environment, you don't have much confidence," explains Jonathan of his first year at Phillips Exeter Academy. "The computer room was an easy place to go and hide. It's the ideal escape."

"It was something that was in my lifestyle at home," continues Jonathan, who first learned to program in 1979 when his family bought an Apple II computer. "It was familiar in the sense that I knew what I was doing. So I turned to it."

Seeing a computer, "I just got excited," says Jonathan. "Here's this thing that would do things with me, that wouldn't cut me down. It would never say, 'No,' or 'I have to go eat



Jonathan Franklin, with San Francisco Bay in the background.

lunch, see you later.' It never judged me or made criticisms. It was something you could control. You tell it what to do, and it does it. It was always there. It was so dependable."

Was the computer his friend? "Oh no—what a horrible idea!" responds Jonathan. "The computer was *there*, it wasn't my friend! In the same way that it couldn't be mean to you, it couldn't be nice to you. It was a one-sided affair, so to speak!"

"But the computer gave me confidence because I was good at something. People would come to me with their homework, and I would be excited because someone was actually relying on me."

GROWING ADDICTION

The growth of his addiction "was very subtle," recalls Jonathan. "I didn't realize what was going on. All of a sudden I was spending eight hours a day in the computer room."

"I would often get up at 6:30 and skip breakfast and trudge across the barren, winter wasteland to the computer room, and wait for it to open at 7:00 so I could get some time in before my first class."

Heading to the computer room, Jonathan would feel "excited" as he

contemplated some new solution to a programming problem, such as how to move the ship in a game he was writing. He was spending more and more time working on projects that weren't assigned. And though he never cut his classes, Jonathan wasn't devoting the time he should have been to homework.

At night he could still be found in the computer room. When it came time to leave, "I was frantic! 'Oh no! I gotta cram just one more idea in!'" He would log off with only three minutes to go before last call at the dorm, "and run off into the snow and into the dorm, huffing and puffing. Often I'd bring a printout and put aside my French books and start scribbling." His grades started slipping.

Computer addiction is "more acceptable than drugs or alcohol," says Jonathan. "Most of the other addictions are passive, or fun. But with computers the rationale is that you're actually producing something. But it's basically the same as other addictions in how it influences your actions."

"The main sign is when you start skipping things that you used to enjoy. When you lose the sense of re-

SARAH KORTUM is *lifestyles editor* of FAMILY COMPUTING.

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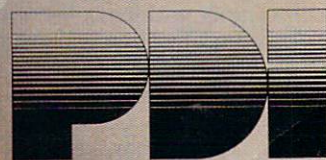
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sponsibility to others and to yourself. I was skipping meals, I was staying up later than my bedtime to run through programs in my mind. I started losing a sense of what's right and what's wrong."

NONSTOP PROGRAMMING

Most of Jonathan's time at the computer was spent programming games, "mainly space games and shoot-'em-up games," he says. "One of the crucial things in using a computer, as in everything else, is knowing when to stop. I was never good at that! I'd write one program and put it down and write another, and then I'd join the two. And then I'd write a third one and make it a trilogy! The longest program I ever wrote was the one where I lumped all my programs together!"

"It came to about 1,700 lines (of BASIC). It's sort of like a clay sculpture that you keep on adding to but you never fire or glaze it, you just keep glopping more and more clay on until it becomes unmanageable!"

What absorbed Jonathan the most was the process. "I didn't really care that much about the finished product. I never sat and played the game, except to test it. After I was satisfied that it worked the way I wanted it to, it was on to the next one."

Jonathan never shared his work with others during that period, though he would fantasize about how someone might enjoy it. "There was no feedback. It was more self-satisfaction because I wasn't really involved with people at that point."

Even in the computer room, "I was never very social," recalls Jonathan. "I was the person who was sort of jelling with the machine, not watching the time."

"I wouldn't say that what I learned from the computer during that period has helped me that much," concludes Jonathan. "I was already computer literate, on [my family's] Apple. When you're addicted, things come out so crazy and crooked. Looking back, I think that what's most important is to write a program cleanly and logically. That's when you really start learning. You can write five hundred dumb, boring programs, but if you have one good idea, and you execute it well, that one is much more worthwhile. It certainly is quality not quantity."

"But seeing that I never got away, I never got an aerial view of my programming and what I was actually doing. Computers are so involving, if

you get obsessed with them, you often don't realize it."

"Nothing alarmed me. I was going along on my own merry way thinking that computers are great, computers are going to save the world. Everybody is going to have to use them. I'll get a head start."

"I would have been infuriated if somebody had come along and said, 'Stop it. You won't do that anymore.' I probably would have said, 'I'm sorry, no, I have to keep doing this, for the good of mankind!' That driven sort of reaction."


"When I wrote home, which wasn't very often, a lot of the time it was about how great computers are. I've recently seen some of the letters, and they're just fanatical! My mother would write and ask if I was making friends. I'd just sort of shrug [her queries] off."

THE TURNING POINT

"The turning point was spring vacation." Jonathan flew back home to San Francisco, leaving his programs behind. "I left school thinking, 'Oh no, what am I going to do without

the [school's] computer?' But the vacation was good in that it forced me to step back and look at that one conglomeration of programs I'd been working on all winter. I realized it was not that worthwhile."

"When I left there was snow on the ground and gray skies. I came back to a new world. People were playing Frisbee, the sun was out. School was going to be over in two months. Everybody is happier in the spring. And that positive attitude really changes the way you think. I realized I didn't have to hide."

Jonathan is now a senior at Exeter, and was recently voted proctor of his dorm, making him a liaison between the students and the faculty. He is on the board of WPEA, the student radio station. And he has developed a number of close friends, though he hasn't forsaken his old companion: the computer. Jonathan spends about an hour a day writing programs and papers on his Kaypro II portable computer. "But it's like a part-time job now," he says. He is the author of this month's Puzzle program. 

IS YOUR CHILD BECOMING A COMPUTER ADDICT?

Here are some words of advice from one who has been there and back.

1. DON'T MAKE EXCUSES

"Parents like to think that their children are special and really smart," says Jonathan Franklin, a 17-year-old reformed computer addict. Often when parents look at a child who is overdoing it on the computer, they tend to think, "Oh well, at least he's getting something done, and he's exercising his mind." Don't turn your back to "how obsessive a computer can become."

2. TRY AND TALK

"Once I saw addiction coming along, I'd bring it up," says Jonathan. "I'd say, 'Look, I'm aware that you're spending an awful lot of time at the computer.' It's worth learning what your son or daughter is thinking about." But don't push them to talk. "Acknowledge the problem but don't overemphasize it. It may be just a stage."

3. DON'T FORCE ABSTENTION

Jonathan advises that except with young children, "something you

shouldn't do is make solid rules: 'You cannot use the computer between the hours X and Y. You cannot use disks B and C without my permission.' Because if you say, 'Don't eat the cookies, don't eat the cookies,' the one thing a kid is going to do is eat the cookies. You don't want to police the situation. Because freedom is part of learning."

4. ENCOURAGE INTERACTION

"If I knew my kid was getting too involved in the computer, I would try to underhandedly get him or her involved in other things," says Jonathan. "I wouldn't blatantly say, 'You gotta go out and make friends,' but I would say, 'Why don't you invite one of your friends over who uses the computer?' With friends over, they're bound to digress."

5. LEARN ABOUT COMPUTERS YOURSELF

"If parents involve themselves, it makes the computer less of a solitary activity," says Jonathan. "It's good to have a friend to talk things over with. A computer is just one way to bring a family closer together."

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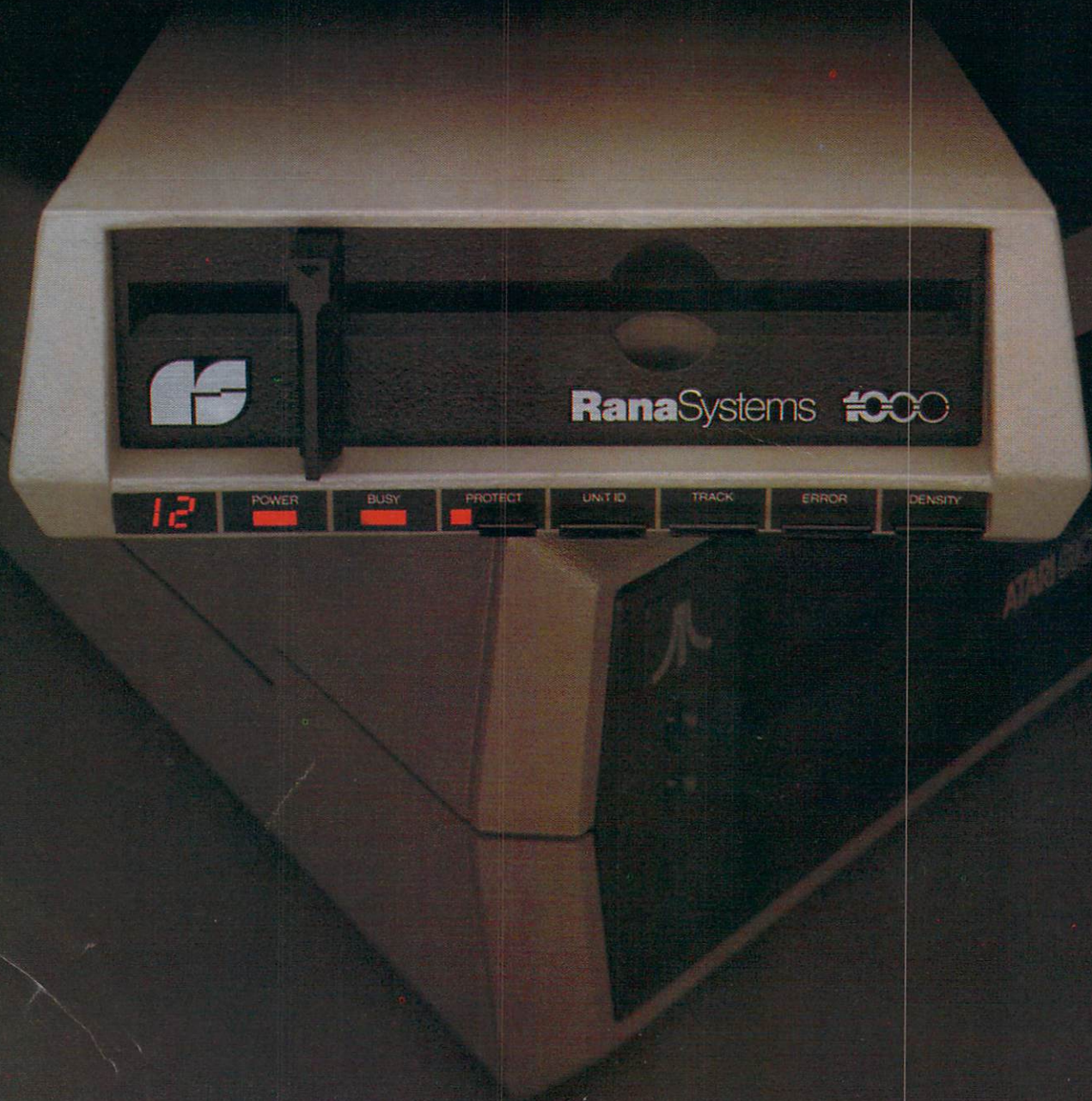


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COMPUTING CLINIC

PUBLIC DOMAIN SOFTWARE/ SAVING TO TAPE/ CRT EMISSIONS CONTROVERSY

BY WALTER KOETKE

What is "public domain" software and where do I find it?

Software that can be legally copied by everyone is called public domain software. No one has a copyright on public domain software.

Since some hardware manufacturers (Atari and Commodore in particular) make public domain software available through their dealers, start looking for it at your local computer stores. In addition, many stores have their own collection of public domain programs. All of this is usually available for the cost of a tape or disk, plus a small handling fee.

Local user groups are also a good source. Bring some blank tapes or disks to a meeting and you should be able to obtain some public domain material. You might also check with your local school system. If there's a good source of inexpensive software, the students or teachers are almost sure to know about it. One of the largest collections of high-quality public domain educational software is available from the SOFTSWAP Microcomputer Center (San Mateo County Office of Education; 333 Main Street; Redwood City, CA 94063). Send them a stamped, self-addressed envelope and ask for their disk order form.

While I encourage your search for public domain material, I also suggest that there is truth in the old saying, "You get what you pay for." Most authors of good original mate-

rial are interested in being published commercially, and under the protection offered by copyright.

Several major microcomputer makers are losing hundreds of millions of dollars this year. Are these companies likely to survive? Should I buy from one of them and risk the loss of service/support in the future?

If I could accurately predict the future of just two or three companies I'd own a magazine instead of working for one. When a company such as the Osborne Computer Corp., which makes just a few products for a single marketplace, loses lots of money, survival is unlikely. When a company such as Texas Instruments or Warner Communications (maker of Atari computers), with many products in many markets, loses money in one market, corporate survival is quite likely.

Your concern, however, is justified. I do not recommend purchasing a microcomputer if you aren't reasonably confident that it can be supported—with software, peripherals, and service—for the next five years. This means that the manufacturer and your local dealer who provides the service must remain in business. I wouldn't worry beyond five years because at that time you will probably be able to purchase a more capable system for less than the cost of repairing an old one.

I'm a freelance writer who uses a word processor—which means I spend several hours a day in front of a monitor. Should I be concerned about harmful emissions or other potential health hazards?

You've asked what has been, and I expect will remain, a controversial question for a long time. Bell Tele-

phone of Canada, for instance, is aware of the controversy, and permits pregnant operators of video display terminals to transfer to other jobs during their pregnancies. On the other hand, a two-year study by the National Research Council of the National Academy of Sciences recently concluded that the regular use of video display terminals will not impair vision. Meanwhile, 9-to-5, a national association of office workers, uses a hot line to collect proof of the need for federal safety regulations for workers using video display terminals. And on goes the controversy.

Video display terminals, including TVs, do emit very small amounts of X-rays, ultraviolet light, and positive ions. For about \$125 you can purchase a Somashield that will block almost all of the low-level radiation. Check with your local computer store for availability.

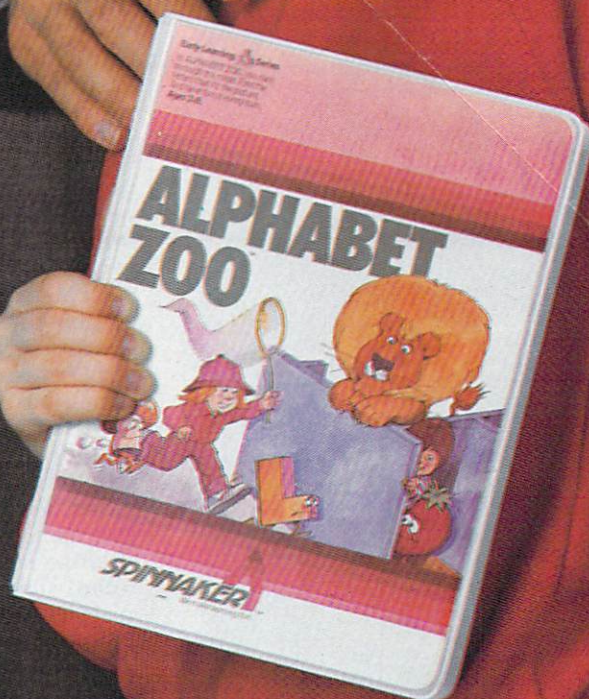
If you're worried about the problem, you can take a few steps on your own. Be sure to use a monochrome display rather than a color display for word processing, or any application that requires reading text or numbers for long stretches of time. The resolution is much better. Amber on black displays are best for the eyes. Green on black is your second-best choice.

Also check your lighting. The optimum lighting for work with pencil and paper is brighter than the optimum lighting for work with a video display. Tilt and turn your screen to eliminate glare; to do so, you may have to rearrange your work area.

Can you clean heads on disk drives as you can on tape recorders?

Yes, it's possible, but I advise you not to do it yourself. There are just too many pitfalls, since you must

WALTER KOETKE introduced computers into U.S. public schools, linking the Lexington, Massachusetts, system to a mainframe in 1964. In 1969 he worked with Seymour Papert, inventor of LOGO, who brought that programming language to the same school system. He has written for Creative Computing and Microcomputing magazines, and frequently lectures about computers to parents and educators.



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COMPUTING CLINIC

open the disk drive, perhaps temporarily disconnect some components, and then clean a relatively fragile, finely adjusted read/write head.

Under normal circumstances, I suggest having your local dealer or service center clean, demagnetize, and realign your disk heads on an

annual basis. The dealer can also adjust the speed of the drive. If there have been any factory-suggested modifications, these should also be completed. The annual checkup should be reasonably priced and will contribute significantly to reliable use.

There are several head-cleaning

disks available. But, in my experience, they have made no identifiable difference in disk performance, reduced maintenance requirements, or cleared up an existing problem. Furthermore, they can actually wear down the heads if used too often.

Does it matter if you leave your disk drive door open when not in use?

Open or closed—I don't believe it makes any difference at all. If it does, then at least one of the hardware makers should have mentioned the subject in a manual. None did.

I've had trouble storing programs on tape. Some get saved and some don't, but there's no identifiable pattern. Any ideas?

Look at the tape heads. They should be smooth and spotless. If you can see dark streaks, the heads are very dirty and should have been cleaned some time ago. Since even minute particles on the read/write heads will degrade the performance of your cassette recorder, you should clean the heads every couple of weeks. I suggest using cotton swabs and a head-cleaning solution available at most record stores. You can also purchase special head-cleaning cassettes, but I believe that a swab in the hand does a much better job.

Whenever you clean your recorder, I also suggest demagnetizing the heads. This can be done with a hand-held demagnetizer (available for less than \$10) or a battery-powered demagnetizer (available for less than \$25), which looks like a cassette. The battery-powered device should give more consistent results.

If cleaning and demagnetizing don't eliminate your problem, try using a higher quality tape. Average-quality audio tape should be sufficient. Lower grades can give inconsistent results with computer data.

If problems persist, the computer or recorder will most likely require service. Be sure to get an estimate before having your recorder repaired. The cost of parts and labor may make purchasing a new recorder a better choice. **RE**

Send your questions, general or machine specific, to: FAMILY COMPUTING, Computing Clinic, 730 Broadway, New York, NY 10003. Please include name, address, and phone number.

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LIGHT TOUCH

THE MAN WHO BOUGHT TOO MANY PERIPHERALS

BY DAVID KOVACS

One morning last week was exceptionally beautiful, so I unplugged myself from my micro for a stroll along a nearby beach in search of creative inspiration. There, among the driftwood, was a very strange looking bottle, with a piece of paper inside.

Hmm, I thought. Either I've been playing too many games of *Zork*, or this is real. Oddly, I was almost hoping for something in the way of a real-life adventure as I pulled out the cork. There, folded inside, was a very long document on tractor-feed paper. The printing was dot-matrix, and the message was a strange one indeed.

"THANK YOU FOR OPENING THIS MESSAGE!" it began enthusiastically. "PLEASE DON'T IGNORE IT! I AM COUNTING ON YOU FOR HELP!" Any doubts I had about its authenticity were dispelled. This wasn't fan mail from some flounders. This was a real message.

The letter's tone became calmer. "I am writing this from a deserted island, light years from civilization, where I am now living until my sanity returns. Please realize that I was not shipwrecked. I chose to come here. I like it. There is peace, and serenity. What made me come here? What was it that almost drove me out of my mind? I can sum it up in one word: peripherals.

"I still remember the day I brought my computer home from the store. Like a kid on Christmas morning, I tore through the packing material, placed it on my desk, plugged it in, and turned to the first page of the



manual, eager to begin processing my words, balancing my checks, and 'Vising' my Calc. I couldn't wait to start living my lifelong fantasies of fighting pirates and goblins, managing a big-league baseball team, and defending the planet from certain destruction.

"But these pleasures were not to be. Little did I know that buying a computer was like walking into the front gate of an amusement park. There before your eyes await endless varieties of fun and excitement. But if you want to get on the rides, it's going to cost you.

"First there were the disk drives. One wasn't enough—the well-equipped system should have at least two. And you couldn't just buy the drives, of course. There was also the matter of an interface card—one of a series of many-chipped crea-

tures I was to encounter. I found that the going rate for these interface cards, whatever their function, always seemed to be 'a couple hundred dollars.' I gulped, realizing that I could be spending dozens of 'couple hundred dollars.'

"I began to get a sinking feeling in the pit of my budget. What about our family's vacation plans? How could I explain to them that we couldn't afford to go away this year because we had to buy an eight-inch hard disk drive instead?"

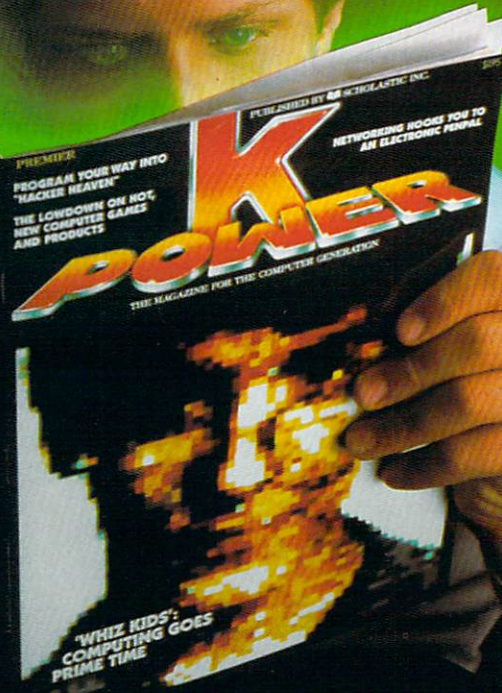
I noticed that the pages of the letter began to be more and more tear-stained. I read on.

"Oh, the peripherals were ingenious, all right. They could do just about everything. One turned a 40-column screen display into 80 columns. Another gave you extra memory. There was another with the

DAVID KOVACS is a Chicago-based freelance writer who occasionally finds his computer amusing. He would gladly consider paying "a couple hundred dollars" for a program that writes jokes.

ILLUSTRATION BY STEVEN MILLER

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The magazine for the computer generation.

LIGHT TOUCH

exotic name of Z-80 that was not a turbocharged sports car, but another smorgasbord of chips that my friends said I really just had to have. There was even a "peripheral peripheral"—a little fan that kept things from overheating with all those turbocharged cards back there.

"As I got on the phone to order them all, I had to gasp for air several times. I distinctly remember the face of my VISA card turning into a hideous, satanic face that seemed to be saying, 'You'll be sorry!'"

"And these interfaces were only the beginning. Did I want to use my own TV set to see what my computer was saying? I could. All I needed was an RF modulator—an item that worked fine, except that the screen display wasn't clear enough to use with my word-processing program. No problem, though. All I needed to buy was a monitor—a mere couple hundred more dollars (unless I wanted color). As I clutched my month's paycheck in hand and left the house for the computer store, my wife and children looked at me with tears in their eyes. My four-year-old asked, 'Mommy, does Daddy love the computer more than me?'"

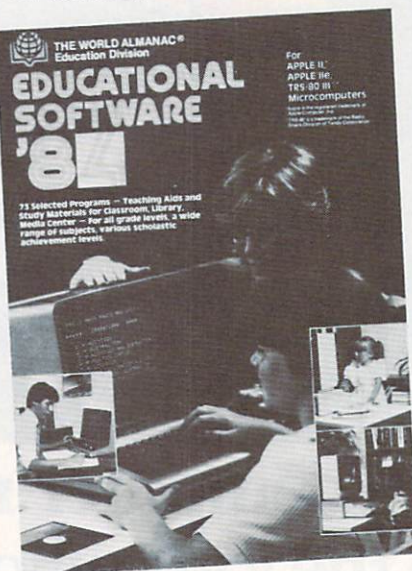
"But still I forged ahead. Of course, I wanted to have printed copy, so all I needed was a printer. This little item (and, of course, its accompanying interface card) would only run me a couple thousand dollars. I cringed as I signed over my family's livelihood, wondering if Computer Hackers Anonymous might be opening a chapter in my community soon.

"I did notice that the computer was helping me to balance my checkbook. After signing away a couple hundred dollars at a time, there wasn't much left to balance. What was left quickly went toward the printer memory buffer card (so I could print and work at the same time), a set of matching joysticks, and the endless varieties of software that seemed marvelous, yet which seemed to call for just one more peripheral to make them work.

"Finally, I said to my family, 'Enough! No more! Daddy isn't going to buy any more peripherals!' My children cheered. My wife wiped away a tear from her eye. With a new feeling of hope and excitement, I grabbed all of the wires from my system, and plugged them into the wall. I slid on the ON button, and watched in horror as the lights in

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my house flickered and then blacked out. One last trip to the store to spend my last couple hundred dollars on a voltage-regulator-power-shortage-preventer peripheral, and I

IF THIS POOR FELLOW
CHUCKED IT ALL
AND WENT TO LIVE ON
AN ISLAND, THEN WHY
IS THIS LETTER ON
TRACTOR-FEED PAPER?

was at last ready to start using my computer."

Here, my correspondent evidently went insane. All kinds of the most unprintable language filled the next eight sheets, which he had scratched out with huge red Xs. On the last page, it read:

"My system never did work. Something in the system was down. And if you have ever tried to check which one of a dozen little peripherals aren't working, you'll know my frustration. I won't describe what happened. A young child might be reading this letter. Suffice to say that it was not pretty. I don't think my neighbors will ever forget the sounds they heard from my house that night.

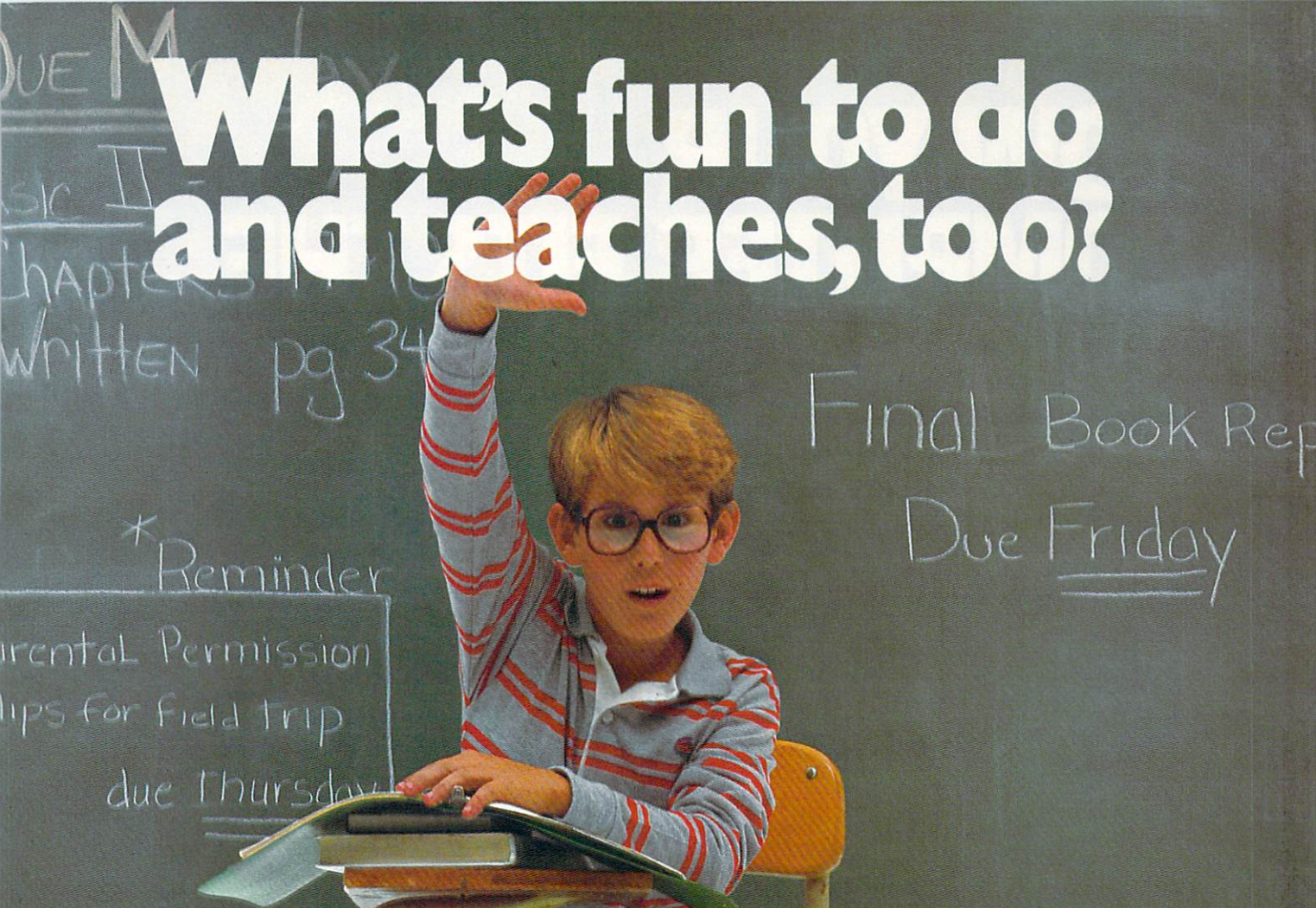
But now all is fine. I have escaped the stresses of my former life. I have regained a calm, inner peace on this island paradise."

But wait a minute, I thought to myself. If this poor fellow chucked it all and went to live on an island, then why is this letter on tractor-feed paper? Why the dot-matrix printing? What kind of a system did he use to write it?

There at the end of the letter it said: "Even though I knew I was going to live on an island, I still wanted to have a computer. So I traded in my whole system and bought a little portable thing with no peripherals. It computes, displays, and prints, all by itself. I love it. The problem is, I'd like to find a modem that would be compatible with it, so I don't have to keep sending letters in bottles."

I looked in the bottle, and there in the bottom were two crumpled up \$100 bills. "I've enclosed my last couple hundred dollars to buy the modem," read the tearstained last sentence. "I hope it covers the cost." [E]

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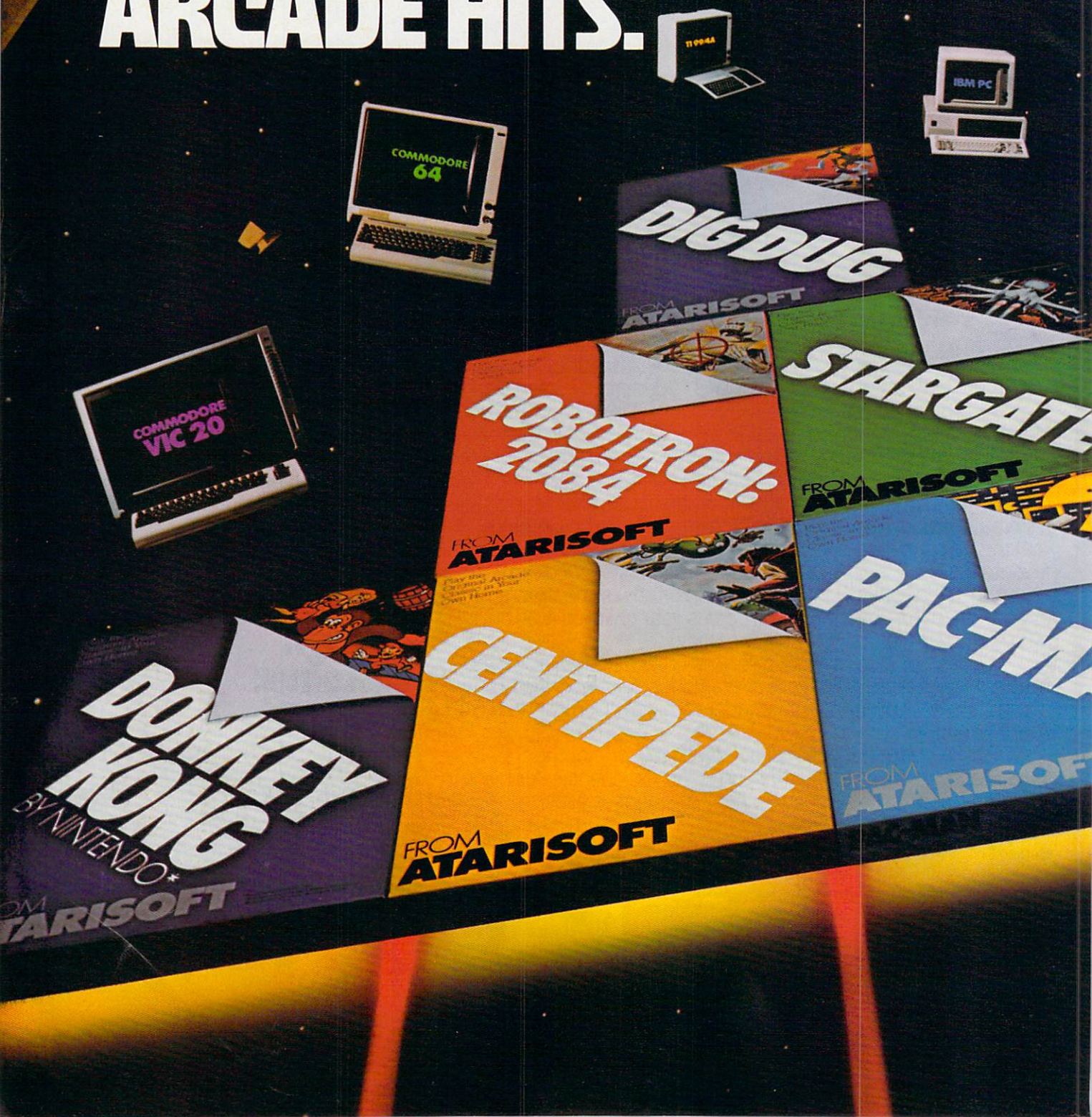
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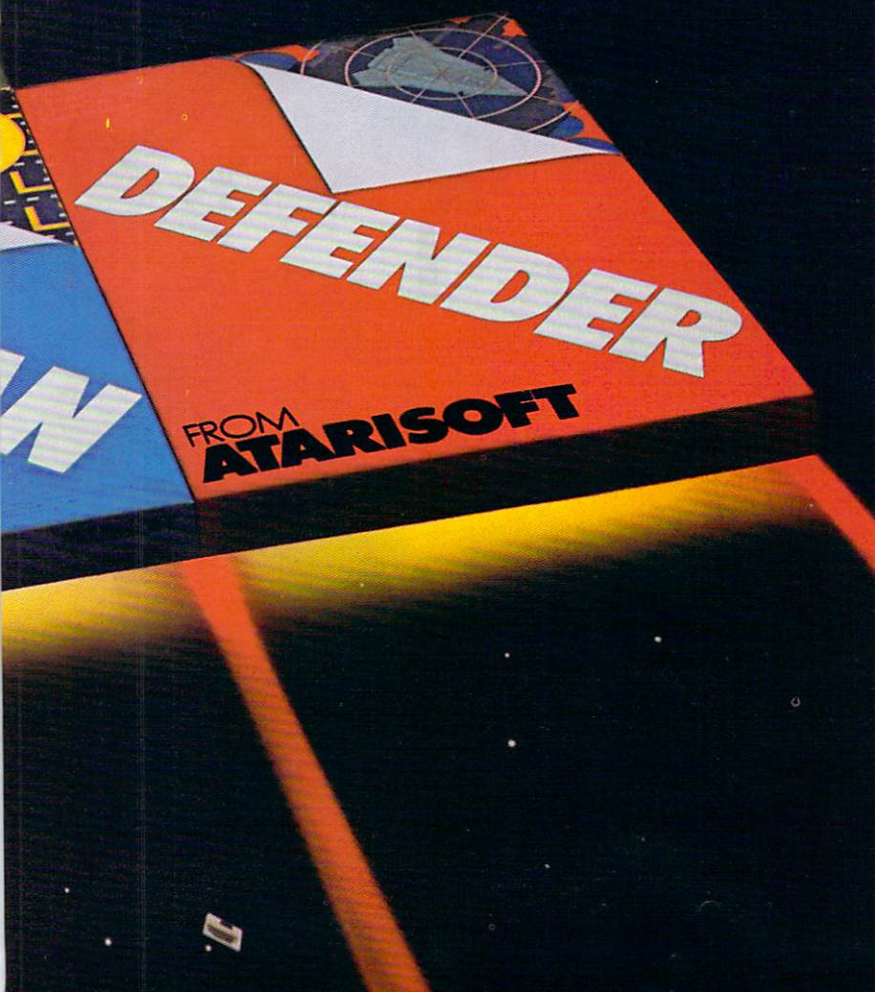
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PHOTOGRAPHED BY ANTHONY LOEW



A No-Hassle Way to Shop?

BATTLING HOLIDAY CROWDS
ISN'T ANYONE'S FAVORITE WAY TO SHOP.
NOW, THERE APPEARS TO BE AN ALTERNATIVE.

BY JANE WOLLMAN

There are two kinds of people. Those who begin their Christmas shopping well ahead of the season's first jingle bell. And those who wait until nearly Christmas Eve.

**"ELECTRONIC SHOPPING HAS BEEN AN
EASY WAY TO ACQUAINT
THE FAMILY WITH COMPUTING."**

Dave Dolsen had always belonged to the second group. That's because shopping was one of his least favorite activities. And bucking holiday crowds made the chore even more of a hassle.

But this year things are different. Dave started to gift shop early—and leisurely—from the comfort of his own home. This year, Dave is Christmas shopping by computer, and so are his wife, Jo Pat, and their two children, Wendy, 15, and Doug, 14.

The Dolsens, who live in Pueblo, Colorado, are members of Comp-U-Store, a 24-hour shop-at-home service that offers a variety of brand-name products at substantial discounts. Comp-U-Store, the country's leading home shopping service, specializes in appliances and electronic devices, but you're likely to find almost anything—from diamond earrings to box springs and mattresses—in its extensive listings that can appear on your computer's video display. The service, which offers as many as 50,000 different products at discounts ranging from 10 to 40 percent off retail list price, can be accessed from virtually any microcomputer or data terminal using a modem, a peripheral device that allows communication over phone lines.

HOW TO SHOP

There are several ways to find bargains on the Comp-U-Store data base: by browsing through its categories, such as video equipment, sporting goods, and cameras; by seeking price and feature information about particular models; by discovering what's available in a particular product area according to your feature and price specifications; and by bidding on products in a nationwide weekly auction. Many people use Comp-U-Store—which was launched in 1981 under the name Comp-U-Star—mainly for comparison shopping to help negotiate low prices with local retailers.

Products and prices on the big data base are updated daily. At the time of this writing, members could spend as little as \$20 for a pen-and-pencil set or as much as \$4,000 for a projection television system. A special section called the "Databasement" has super-duper bargains—such as a 25-inch console color TV for \$399 or a 35mm automatic focus camera priced at \$139. Right now, Comp-U-Store's biggest sellers are videocassette recorders, discounted about 30 to 35 percent.

Given Comp-U-Store's steep reductions, the money saved by buying even one major product each year could well be worth the \$25 annual membership fee and time charges you're billed to hook into the system. Connect rates, ranging from eight and a third cents to 30 cents a minute, vary according to time of

day, your modem speed, and the way you enter the system—either directly or through CompuServe, Dow Jones, or The Source information services. (You must join Comp-U-Store to buy, but you may use these networks to access the data base and browse around.)

When you become a member of Comp-U-Store and sign up for direct access, instead of going through an information service, you're issued an ID number and password, plus a membership number and an access code.

To shop, you make sure your modem is properly hooked up, then dial a local number. When you hear a "connect" signal, you press CONTROL C on the keyboard, and the system will ask you to type in your numbers and password, which links you to the Comp-U-Store computer. A screen will appear, saying WELCOME TO COMP-U-STORE and your shopping can now begin. The whole process takes just a couple of minutes.

If you use an information service like The Source to gain access, the sign on procedure is slightly altered, but it doesn't take much more time.

Shopping is easy. To find the product you're looking for, you type in brief responses

WHAT YOU CAN BUY

Comp-U-Store now offers more than 50,000 name-brand products, and it continues to expand. At the moment, its offerings include choices in the following categories:

- 1. Appliances.** Air conditioners, dishwashers, refrigerators, sewing machines, and more.
- 2. Cameras and Optical Equipment.** Including special lenses, movie and slide projectors, and binoculars.
- 3. Cars and Car Stereos.** Everything from cassette decks to Corvettes.
- 4. Flatware and Crystal.**
- 5. Luggage.**
- 6. Sporting Goods.** Bowling balls, golf clubs, tennis racquets, and tents and other camping equipment.
- 7. Stereos and Audio Equipment.** Clock radios, turntables, receivers, etc.
- 8. TV and Video Equipment.**
- 9. Other Electronics.** Use your computer to buy another computer! Or a phone answering machine, radar detector, and computer accessories and software.
- 10. Miscellaneous.** The most varied list of all: beds and box springs, power tools, lamps, string instruments, pianos, typewriters, watches, and more.

JANE WOLLMAN is also the author of "How People and Machines Can Work in Harmony." Part one was published in last month's issue; Part two appears in this issue.

**THE MONEY SAVED BY BUYING EVEN ONE
MAJOR PRODUCT EACH YEAR COULD BE WELL WORTH
THE \$25 ANNUAL MEMBERSHIP FEE.**

to a series of on-screen menus. All ordering is also handled on-line, again by punching in the appropriate requested information; and merchandise may be either charged to your VISA or MasterCard account or paid by check. Purchases can be delivered anywhere in the U.S.

Comp-U-Store, a division of the Stamford-based Comp-U-Card International, Inc., has some 10,000 members nationwide. It carries no inventory, but lists products from manufacturers, wholesalers, and retailers, who ship orders directly to customers by United Parcel Service or by truck. Thus, the electronic service is able to keep prices low because it bears no overhead costs from stocking goods. (Comp-U-Store gets a five percent commission on each order it processes.)

INCREASING THE INVENTORY

Dave Dolsen, who has bought video game cartridges reduced by 30 percent as gifts, and crystal stemware at 25 percent below retail price, says he'd routinely purchase more from Comp-U-Store if it had a wider product selection. Dave—and other armchair browsers—may be doing a lot more shopping since the service plans to add new categories soon and is also expanding its selection of computers and software programs.

This year Comp-U-Store plans to add some special Christmas-time items to its merchandise mix, including gourmet food, wines and spirits, books, and bed and bath fashions.

Comp-U-Store says it offers 50 to 90 percent of products on the market within its 10 categories (see box). In addition, it regularly schedules specials on such items as women's and men's clothing—merchandise it does not maintain on the fixed roster.

THE DRAWBACKS

If there are areas where Comp-U-Store falls short, they may lie in its product descriptions and delivery procedure. Some members, like Don Mahoney of El Cajon, California, say the descriptive text accompanying some products tends to be somewhat stingy. Since there are no illustrations, Mahoney complains, "this means you have to go out to a store to look at an item before ordering." Mahoney has used the service to buy sophisticated audio gear as gifts for friends and clients of his financial consulting firm. He occasionally buys equipment for the stereo store he owns, because Comp-U-Store's prices beat other suppliers.

A flip through the data base shows that specifics do vary, depending on the product. For instance, a generous amount of information is given about refrigerators, while nothing more than pattern names are supplied with

listings of sterling silverware.

One obvious solution, of course, is to provide pictures as well as text. Although Comp-U-Store does plan to add photographs or possibly even video movies, this enhancement is at least five years away because of the difficulty of developing a technology that's economically feasible, according to E. Kirk Shelton, president of Comp-U-Card's electronic service division.

When it comes to delivery, Comp-U-Store's system is, in theory, commendable. You're sent an order confirmation indicating when to expect the product—on average, within three weeks—and the name of the vendor supplying it. Frequently, though, delivery dates are missed and items arrive months after they've been ordered—and paid for. When there's a snafu, you are given the option of waiting for the item, requesting a substitute, or canceling the order and receiving the refund.


"The biggest problem is getting the vendors to have what Comp-U-Store says they have," says Deborah Dellinger, of Stewartstown, Pennsylvania, a member who had to wait months for some of the items she ordered. Nonetheless, she hopes to buy a grand piano through the service and is planning to use Comp-U-Store for all her major Christmas purchases.

According to Shelton, delivery glitches usually are caused by manufacturer product shortages, situations that surface some time after the companies have specified availability dates. "Often manufacturers lie or say they expect to have the product," he says. "But what it boils down to is suppliers really not knowing how their production schedules will shape up."

Another area of potential annoyance is returning products, since Comp-U-Store emphatically discourages exchanges. Therefore, it's a good idea to be sure the item you order is exactly what you want. "If there's a real problem, we'll make a swap or refund your money," says Shelton, "but if you use a TV set for three months and then decide you don't want it, we won't take it back."

Two of the best things about subscribing to Comp-U-Store: there's no minimum purchase obligation, and if you're not happy with the service, you can drop it any time and your \$25 fee will be refunded.

Dave Dolsen says that because of its practical application, electronic shopping has been "an easy way to acquaint the family with computing." He now even refers to shopping—an activity that used to irritate him—as "entertaining and enjoyable."

Not to mention convenient. Where else but "on line" can you go to buy a bowling ball at 8:00 in the morning? 

**WHERE ELSE
CAN YOU BUY A
BOWLING BALL
AT 8:00 IN THE
MORNING?**

The Layman's Guide to Word Processing

THE ABCs OF WP, AND WHAT YOU NEED TO START.

BY PETER McWILLIAMS



PETER McWILLIAMS is the author of *The Word Processing Book*, *Questions & Answers on Word Processing*, and *Word Processing on the IBM*, all published by Prelude Press.

ILLUSTRATION BY GEORGE BOOTH

In business, the typing pool has been replaced with the WP Department. "WP," of course, stands for Word Processing. Two short years ago, when I started writing about word processing, even many publishers didn't know what it was. "What's word processing?" they asked. We've all learned a lot.

Today, almost everyone knows that word processing has something to do with using a machine to write, just as food processing has something to do with using a machine to chop.

But word processing, really, has nothing to do with machines. Word processing takes place in the human mind. Selecting words to fit a concept, then arranging and rearranging those words until they form a sentence, is what word processing is all about. The machines—from wax tablet and stylus, to pen and ink, to typewriter, to computer—are simply there to help us remember what's already been processed.

Personal computers offer the best method yet for recording the processing of the mind. They allow change so easily. Take the composition of a simple note to accompany your son to the store: "Give one pound of hamburger to Billy."

You look at the sentence and decide you'd like to start off the note with "Please," and add the word "lean" before hamburger. If using pen and paper, you might be able to sneak in the "Please," but the "lean" is more troublesome. Most people don't want to rewrite the note (Billy already has his coat on and is waiting as patiently as Billy can), so the butcher is treated to:

"Please

Give one pound of hamburger to Billy.
(Lean.)"

With a computer and a word-processing program, the note appears on the computer's screen before it's printed. Adding PLEASE, making the "G" in GIVE lowercase, and adding LEAN before HAMBURGER is an easy task. When it looks right on the screen, you can print it and Billy is on his way.

Now, I'm not suggesting you use a computer to correspond with your grocer. Notepads and pencils will be around well into the 21st century. But how about correspondence to friends, relatives, members of Congress, and teachers? Wouldn't the ability to change things around come in handy?

SECOND DRAFTS A BREEZE

As any professional writer will tell you, clarity in writing comes from rewriting. Few authors are satisfied with their "first draft." Similarly, most people are not satisfied with the first draft of a letter, but they send it anyway: recopying is such a chore. And because they're not satisfied with first drafts, many people postpone important letters—sometimes indefinitely.

With a word processor, second, third, and fourth drafts are easy. Words, sentences, and paragraphs can be removed, rearranged, or

added with ease. When it looks right, you can even run a program that will check your spelling and punctuation, and point out possible grammatical errors, before printing the final copy.

Kids, loving computers as they do, are far more likely to learn the fundamentals of good writing with a word processor than with pencil and paper.

GERSHWIN'S PIANO

When the specter of a teacher saying, "This paper is messy with all these crossouts—copy it over," is removed, kids can experiment with style, alteration, editing. In short, they can be creative. Who knows what budding geniuses are just waiting for a tool that removes all the paperwork from writing. I often wonder what might have happened to George Gershwin if his brother Ira had not been given a piano.

For young children, computerized word processing is particularly appealing. Generally, a child's ability to grasp a language develops faster than his or her ability to hold a pencil and make the intricate symbols of our alphabet. Pushing the button marked "A" on a keyboard takes far less manual dexterity than forming the letter "a" on a piece of paper. With a computer, a child's mind is not held back by the still-developing physical coordination.

Further, word processing teaches kids (and parents) the fundamentals of a computer and keyboard far better than, say, BASIC programming. Most kids will need to write letters and reports far more frequently than they'll need to write programs.

Not only is writing made easier (and better) with a word processor, but writing the same thing to several people is a breeze. The next time you return from vacation, you'll need to write about your adventures only once. After printing Aunt Fanny's letter, all you need do is change DEAR AUNT FANNY, to DEAR UNCLE LOUIE, and Uncle Louie gets a personalized letter of his own. For those not in the letter-writing habit, and for those who have as many relatives as I do, this feature alone will save you a year or two over a lifetime.

Some programs will change the name and address automatically. If you're politically active, you can send a letter expressing your views to everyone in Congress in the time it once took you to write only four or five letters. On a smaller scale, with a mailing list of your friends on a computer, you can send out personalized invitations, thank you notes, and Christmas letters in less time than it once took you to address the envelopes.

THE SIX BASIC ELEMENTS OF WORD PROCESSING

Now don't let the dozens (sometimes) of features some word-processing programs offer intimidate you. To successfully and happily do word processing on a computer, you need to know only six things:

**WHO KNOWS
WHAT BUDDING
GENIUSES ARE
JUST WAITING
FOR A TOOL
THAT REMOVES
ALL THE PAPER-
WORK FROM
WRITING.**

ANY HOME COMPUTER IS A MORE POWERFUL WRITING MACHINE THAN EVEN THE MOST EXPENSIVE ELECTRIC TYPEWRITER.

1. How to open (start) a file.
2. How to insert text.
3. How to delete text.
4. How to move the cursor around.
5. How to close (end) a file.
6. How to print a file.

Everything else in word processing comes under the heading of Extra Added Features—which you may *want*, but you do not *need*.

Knowing how to do these six things will make your home computer more powerful than even the most expensive electric typewriters. Why? Opening a file on a typewriter means putting in a sheet of paper. That's not so hard. Then, the text entered is typed directly onto that sheet. So far, so good. But, deleting text from a sheet of paper is hard. It often means starting from scratch again. Deleting text on a computer is easy; you just type over the text you want to delete, or move the cursor around to erase. Therein lies the advantage of computerized word processing over typewriting: Change on computers is effortless.

Furthermore, on most typewriters, if you want a second copy printed, you insert another sheet of paper and start typing it all over again. If you want a second copy printed on a computer, you push a button.

WORDS, WORDS, WORDS

In addition to all the other bits of computer jargon, here are a few terms you're likely to stumble across on the path from typewriting to word processing:

File. A file is the method the computer uses to store a collection of words. It can be anything from a shopping list to *The Great American Novel*. Think of it as an empty file folder into which you can put as many (up to the amount limited by the computer's memory) or as few words as you like.

Word Wrap. This sounds like something you put around your words to keep them fresh—sort of a Saran Wrap for writers. In fact, word wrap refers to the ability of most word-processing programs to begin new lines automatically. Anyone who has used a typewriter knows that as the end of each typewritten line approaches, a bell dings and you must manually indicate when and where the next line begins. With word wrap, the computer listens for its own internal bell and starts a new line without troubling you.

Characters. A character is any number, letter, or punctuation mark.

Justification. No, this is not a set of good reasons why you need a word processor. It refers to the margins and whether they are straight (justified) or not straight (ragged). Most typewriters produce justified left margins and ragged right. Some word-processing programs can produce both justified left and right margins, making the printed text more resemble a book. Most people turn off the right justi-

fication for correspondence: it's a dead giveaway that you're using a computer.

Block. Any group of words in your file that you select. Once a block is marked, you can move it, copy it, add it to another file, or get rid of it altogether.

Insertion. This allows you to insert a word, sentence, or paragraph anywhere in the text. It also allows you to read another file into the file you are currently working on. Your vacation, for example, might be in a file named INDIANA. While writing a letter, when you got to the point where you wanted to tell Aunt Harriet about your glorious two weeks in Grand Bend, you could add INDIANA. (The original file INDIANA remains intact for future letters, memoirs, and *National Geographic* articles.)

Search and Replace. This feature allows you to find any word or phrase in the file and replace it with any other word or phrase. If this year's vacation was very much like last, YOSEMITE could be replaced by DISNEYLAND in your annual vacation letter in a matter of seconds.

Printer Controls. These are various instructions ("controls" or "commands") sent to the printer by the computer while a file is printing. It tells the printer to underline, bold-face, do subscripts (the 2 in H₂O), superscripts (the 2 in E=mc²), or carry out other special print functions. In other words, these commands format the words on your screen so they are printed out the way you want. That is, assuming your printer can do the things you want.

WHAT YOU NEED TO START

To do word processing at home, you'll need a computer, a word-processing program, and some kind of printer. In putting together your writing machine, there are a few other details to consider.

Keyboard. The most important part of a computer for word processing is the keyboard. The easiest keyboards to use are real keyboards, such as the ones found on electric typewriters. Flat keyboards, such as those found on the Timex Sinclair 1000 or the Atari 400, make processing more difficult—although not impossible.

Some computers have little rubber keys, known as chiclet keys, because they look and feel like Chiclets chewing gum. Although word processing with chiclet keys is possible, regular keyboards (with what are sometimes known as "full travel" keys) are preferable.

Screens. Screens are also important. Your TV will provide an acceptable canvas for your prose if you write only a few letters a week. If, however, you're planning a *magnum opus*, you might want to invest in a monochrome monitor. Not only is monochrome (green-and-white, say, rather than color) easier on the eyes, the characters tend to be sharper, thus easier to read and work with.

On some computers, the screen displays only 16 lines, and for some people this is

Features to Look for in a Word-Processing Program

While all word-processing programs allow the six main functions noted in the main article—opening and closing files, inserting and deleting text, moving text around, and printing out—some implement these functions more conveniently and faster than others. The realistic approach is to test as many word-processing programs as possible before buying, and to do so with some knowledge of what the state of the art in word processing can provide.

Remember that no program will overcome entirely the limitations of your computer, such as lack of lowercase letters, lack of shift key, or a small screen display. To change these things, the hardware must be modified.

Outlined below is a list of what we feel are desirable features in a word processor. Few, if any, of the word-processing programs available for microcomputers implement all these features, though some come very close to, or actually surpass, all our standards.

WHAT YOU SEE IS WHAT YOU GET:

The best word processors display on-screen what will ultimately appear in the final printed document. Thus, underlined text appears underlined, centered text appears centered, screen margins duplicate print margins, etc.

ONE MODE OPERATION:

For maximum convenience, all writing and editing functions of a word-processing program should be accessible within a single "write-edit" mode. Having to switch into a special "edit" mode to make simple corrections is time consuming.

COMMANDS:

All but the most complex functions of a word processor should be accessible through simple (preferably one- or two-keystroke) commands. When CTRL/key combinations are used (pressing the control key in combination with one other key), the combinations should be chosen sensibly. For example, pressing CTRL/I for "insert" and CTRL/D for "delete" makes more sense than pressing CTRL/Q and CTRL/L; for these same functions.

HELP MENUS:

Explanations of functions and the commands needed to implement them should be available to the user when editing a file. Some programs require that you exit the file and go to a main menu, or consult the manual.

IDiot PROOFING:

The user should be required to verify, with a "yes" or "no," before any potentially destructive functions (block delete, file delete, clear buffers, etc.) are carried out.

FILE COMPATIBILITY:

Text files created by a word-processing program should be stored to disk in a format normally readable by the computer. For example, it is convenient to be able to edit BASIC programs with the word processor, then store these files to disk and be able to load them directly for running.

MOVING THE CURSOR:

Cursor-control keys serve to move the cursor by a single

space or line. Simple commands should allow "scrolling" of text up and down, and fast movement to the beginning or end of text.

ADDING TEXT:

It's possible to insert or add text anywhere in the document in two ways. The preferable method is by overstriking existing text, which automatically deletes it. The second choice is to insert new text, then delete the old text.

DELETING TEXT:

All word processors can delete single letters to the left and right of the cursor by a single keystroke. Additional and praiseworthy features on some programs include: deletion of single word, sentence, paragraph, or block with one or two keystrokes maximum.

MOVING TEXT:

This amounts to "cut and paste" editing. It should be possible to move a fair-sized block of text from one section of a document to another by a simple process of highlighting the block using the cursor and issuing a "cut" command; then moving the cursor to the point of insertion and issuing a "paste" command. Ideally, both "cut" and "paste" commands should be supported by dedicated function keys. A similar highlighting procedure should allow block deletion and block copying. A very advanced feature is the ability to take a block of text from one document file and insert it in another.

FILE-MANAGEMENT FUNCTIONS:

A word-processing program should be able to provide the user with an index of the files contained on the current document disk. It should be possible to rename files, write-protect them (preventing accidental erasure), as well as delete them after verification. The word processor should also be able to initialize and format diskettes as required by the operating system.

PRINTING FUNCTIONS:

All programs allow you to print out a file document after you've finished writing, editing, and storing it. Some programs allow you to do much more. On these, it's possible to configure the program to support a variety of printers. Simple print functions such as boldface and underlining should be supported either by on-screen formatting or by codes imbedded in text. It should be possible to alter margins, linespacing, pitch, and justification of the printed document, as well as to add headers and footers, from within the word processor. Special features of a particular printer should be made accessible by allowing printer control codes to be embedded in text.

DOCUMENTATION:

The bottom line. Even a great word-processing program can be undermined by poor documentation. If possible, don't let the salesperson walk you through the demonstration. Pick up the manual and try to figure things out for yourself. While it's true that any word processing will take a week or so to get used to, you want to know that you'll be able to use it again easily after a long layoff.

POPULAR WP PROGRAMS BY COMPUTER

The following summary reviews cover the most popular word-processing programs for the various computers listed here. For Apple, IBM, Commodore, and the CP/M format there are many more programs available. But, when shopping around, you may want to look at the standards first.

APPLE WP PROGRAMS

As in most software categories, a long line of word-processing programs is available for Apple computers. **Apple Writer II**, **Screenwriter II**, and **Bank Street Writer** are the most popular made-for-Apple programs, and with the addition of an 80-column card and a CP/M disk, high-powered packages (such as **WordStar**) will run.

On the Apple II plus, all these programs work much more efficiently with a shift-key modification, though it's a \$50 operation that voids the Apple warranty. Without the modification, making capital letters is an arduous, annoying process. The Apple IIe comes factory-built with a regular typewriter-style shift key.

Apple Writer II is a satisfactory program, and relatively easy to use, though it is not particularly powerful. You cannot "overwrite" text, but must first delete the error and then insert new text. And, when working on one file, you cannot get a disk directory of other files without rebooting the master disk. However, it does have a good HELP menu, with a list of commands. With an 80-column board installed, it provides 80 columns of text. And it has a rare split-screen feature, which allows you to display two portions of one file (the beginning and the end, say) on the screen at one time.

Screenwriter II is somewhat more powerful, and offers a 70-column screen display without an 80-column board. This is a major plus. It also permits intricate print formats, including underlining, and footnotes. In some cases, however, the same function, such as inserting text, has two different control commands, depending on the mode you're writing in. This takes some getting used to, and can be annoying. So can the slow process of loading and saving a file, and the slow response time to keyboard commands. Nonetheless, many users consider **Screenwriter II** to be the best word-processing program written specifically for the Apple. It will do almost anything the average user could want.

Bank Street Writer, developed for children but powerful enough for adults, is probably the easiest word-processing program on the market to learn and use. Five or 10 minutes and you'll be off. There's a command directory at the top of the screen above the text, so you always know what "mode" you're in (erase, delete, move, etc.). Its question-and-answer routines make giving print commands a snap, and it adapts automatically to most printers. The drawbacks: a 40-column screen display, and the need to shift into different modes every time you want to move the cursor. This can slow down the fleet-fingered. But, all in all, it's a snappy program that establishes a new standard in its price range.

At the opposite extreme is **Pie Writer**, a very powerful package with a lot of functions and commands—too many, probably, for the average user. But many of the commands are quite simple—"E" for edit, "C" for catalog, etc.—and if you want to go further you can. With an 80-column card, **Pie Writer** permits display of 128 characters; the screen scrolls to the right to let you see more than 80. This is most useful if you need to make charts. At its price (\$149), it's a lot of power for the dollar. **PFS: Write**, part of the **PFS** family of business programs, is also attractively priced at \$125.

APPLE WRITER II; Apple Computer Inc., 20525 Mariani Ave., Cupertino, CA 95004; \$150; \$195 for Apple IIe version.

BANK STREET WRITER; Broderbund, 1938 Fourth St., San Rafael, CA 94901; \$95; available for Apple and Atari.

SCREENWRITER II; Sierra On-Line, 36575 Mudge Ranch Rd., Coarsegold, CA; 93614; \$125.

PIE WRITER; Hayden Software Co., 600 Suffolk St., Lowell, MA 01853; \$150.

PFS: WRITE; Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94043; \$125; IIe only.

ATARI WP PROGRAMS

Although comparable in raw power to the Apple II plus, the Atari computer is not widely supported with word-processing software. Yet the few Atari word-processing packages that exist are all fairly complete, friendly, full-functioned tools.

Of these, the best is **Letter Perfect**. Driven largely by CTRL/Key combinations, **Letter Perfect** has a full range of block-move and copy commands, as well as global search and replace, screen justification, tabbing, insert and overstrike modes, and a variety of delete functions. Epson, Atari, Diablo, and Qume printers are supported on-line, and the software can easily be configured to work with others. **Letter Perfect** comes in both disk and cartridge format, the disk format in two versions, one supporting the Bit-3 80-column card.

The program is compatible with a range of powerful subsidiary software for data-base management and list-processing applications. Its only weaknesses are the poor quality of its documentation and the fact that its files are incompatible with those of Atari DOS. However, publisher LJK sells an inexpensive disk-utility program allowing the transfer of files from LJK DOS to Atari DOS and the reverse, as well as file merging.

The **Atari Word Processor** is also a fairly powerful program, though less economical of memory than **Letter Perfect**. Disk-based, it demands a minimum of 48K memory. Command menus appear on-screen with text. The editor has a full range of cursor-move, block-move, search, and replace commands, plus a variety of insert and delete options and an "undo-delete" function. In editing, text is formatted to 80 columns; the Atari's 40-column screen scrolls over it horizontally. This prevents the user from seeing entire lines of text, but allows reliable "what you see is what you get" print formatting from within the edit mode.

Documentation is excellent, and a disk tutorial is included, along with a narrative audio cassette. Unfortunately, **Word Processor** supports only the Atari dot-matrix and letter-quality printers; owners of other printers buy at their own risk.

AtariWriter, also by Atari, is a cartridge-based processor. Within its editor, **AtariWriter** is largely command-driven via CTRL/Key combinations. There are no HELP menus. **AtariWriter** formats text in 40 columns, but aside from this limitation, preserves most of the editing functions of the Atari **Word Processor**, including the

handy "undo-delete" function. **AtariWriter** supports both Atari and Epson printers (and compatibles), and has some exotic print features, including a double-column printing format. Text files may be saved either on disk or tape, and transferred freely from one to the other. Documentation is quite good.

Text Wizard, by Datasoft, is comparable in some respects to **Letter Perfect**—it is a high-quality, full-function word processor at an attractive price. Disk-based, the program is entirely compatible with Atari DOS, and can be used as a program text editor. **Text Wizard** is largely command-driven, both within the editor and in other function areas. Menus are conspicuously sparse in this program, though command structures are logical and can be memorized easily. **Text Wizard** formats text on-screen in 40 columns. Files may be merged, and portions of text moved from one file to another quite conveniently—an

advanced feature. Output formatting is very powerful, accomplished by imbedding control characters in text. Print margins can be set with unusual precision, and double-column printing is possible. Documentation is clear, concise, and gives full explanations of all commands, along with examples.

ATARIWRITER; Atari, P.O. Box 61657, Sunnyvale, CA 94086; \$99.95.

ATARI WORD PROCESSOR; Atari, address above; \$149.95.

LETTER PERFECT; LJK Enterprises, P.O. Box 10827, St. Louis, MO 63129; \$99; Atari 400/800 (Apple II plus/IIe version \$149.95).

TEXT WIZARD; Datasoft, 9421 Winnetka Ave., Chatsworth, CA 91311; \$49.95; Atari 400/800.

COMMODORE 64 and VIC-20 WP PROGRAMS

The Commodore 64 is a powerful and popular computer with sophisticated graphics capabilities. It is not surprising, therefore, that quite a few word-processing packages are available for it. What is surprising is the almost uniformly mediocre quality of these products. Some seem to have been adapted more or less directly from software designed for the older, less capacious VIC-20—and most have weaknesses that make them inappropriate tools for the serious writer.

An important point to note when shopping for a C-64 or VIC word-processing package is whether or not the software supports the Commodore RS-232 port. Use of this port is required for most letter-quality printers. Many of the word-processing programs for the Commodore computers support only the Commodore serial port as a device driver. In effect, this means that only Commodore printers, or others compatible with the Commodore serial protocols, may work with these programs.

Quick Brown Fox is a cartridge-based word processor available for VIC-20, Commodore 64, and a variety of other computers. **QBF** allows use of the RS-232 port with a few minor restrictions. There are separate modes for text entry and editing; moreover, editing is line-based and somewhat clumsy. However, all common editing functions are available, and the program includes some advanced text-management functions, such as the inclusion of standard "boilerplate" paragraphs from common disk files. Print formatting is by imbedded control characters, and overall print control is menu-driven.

Unusually powerful in some respects and surprisingly weak in others, **Paper Clip**, available in disk format for the Commodore 64, is among the most expensive (\$125) of the C-64 word processors. Its producers have adopted an unusual form of copy-protection: Unauthorized copies of the program will not run without the insertion of a special device—included in the package—into the front joystick port of the computer.

Paper Clip allows text entry in a variety of "virtual" screen widths, ranging from 40 to 124 columns. It allows full-screen editing; however, text breaks unevenly at the ends of screen lines, and attempts to manually reformat this text to improve on-screen readability will ruin the

appearance of the text as it is printed out. Among **Paper Clip's** more advanced features are column editing (allowing definition of a mid-screen column of text or figures as an edit block), the ability to add columns of figures imbedded in text, and insertion of boilerplate text from common disk files. Text may be stored on disk or cassette tapes.

Easy Script 64, by Commodore, is available in both disk and cartridge formats for the C-64. The program suffers from the same lack of true word-wrapping as does **Paper Clip**—but otherwise seems to be marginally superior to the more expensive program in ease of use and versatility, particularly in formatting printed output. **Easy Script's** editor allows the usual cursor-move, block-move, and copy, insert, and delete functions. Subsidiary programs for file-management applications, such as merges and mailing lists, are available to the user on the program disk, and may be selected from the main **Easy Script** menu. A wide variety of printers, including RS-232C systems, work with **Easy Script**. Its documentation is unusually comprehensive.

HESWriter is available in formats for both VIC-20 and Commodore 64. The program is cartridge-based, and does not support the RS-232 interface in its current version. Least expensive of the word processors reviewed here, **HESWriter** nevertheless supports a full range of functions, including word wrap, copying and block moves, string search, and a variety of deletes—and allows full-screen editing. **HESWriter** files may be freely merged, and may be stored to disk or tape. Print formatting is accomplished via control characters embedded in text, and the range of print control functions is extensive. A best-seller.

EASYSRIPT 64; Commodore Inc., 1200 Wilson Dr., West Chester, PA 19380; \$80; Commodore 64.

HESWRITER; Human Engineered Software, 71 Park Lane, Brisbane, CA 94005; \$39 (VIC-20); \$49 (Commodore 64).

PAPERCLIP; Batteries Included, 71 McCaul St., Toronto, Ontario, Canada M5T2X1; \$125; Commodore 64.

QUICK BROWN FOX; 548 Broadway, Suite 4F, New York, NY 10012; \$65; VIC-20, Commodore 64.

CP/M WP PROGRAMS

To take care of basic business, such as transmitting information to the screen and memory, a computer depends upon its operating system program. Most home computers run their own, proprietary operating systems, making one brand of computer functionally incompatible with others. Over the past several years, however, several microcomputer operating system standards have

emerged. Of these, the most widely used is the CP/M operating system (Control Program for Microcomputers), available on a wide variety of machines that use the Z-80 microprocessor. Computers designed primarily for business, such as Osborne, Kaypro, and North Star, were built around CP/M. But, many general-purpose computers can operate in the CP/M mode with the addition of a Z-80

circuit board and a CP/M program on disk. And, if you want a professional word-processing program, you'll probably have to turn to a CP/M program.

WordStar is one of the best word processing programs around. Put simply, **WordStar** can do almost anything any other word-processing program can do and has become the standard by which others are measured. It's not cheap (\$495), it's not particularly easy to learn, and it's certainly not for everyone—but if you're considering any serious and ongoing writing, printing, and/or mailing, look here first. One particularly nice feature is that you can display the command menus on-screen with the text when in the training-wheel stage, and banish them to the nether world of the computer's memory when you're in second gear. They're still only a button away. **WordStar** requires two disk drives.

Perfect Writer's not far behind, and it's cheaper. Though it can do almost anything, some people find it a

cumbersome program to learn, and to print out from. It's recommended only for those who know their way around a CP/M system.

Peachtext may be a compromise between **WordStar** and **Perfect Writer**. Its functions satisfy the needs of both semi-occasional and professional users, and it's relatively easy to learn and use. But it has several configurations, and a specific 80-column card and printer must be specified for the dealer's special installations.

PERFECT WRITER: Computer Services Corp. of America, 1400 Shattuck Ave., Berkeley, CA 94709; CP/M, IBM PC; \$395.

WORDSTAR: MicroPro International, 33 San Pablo Ave., San Rafael, CA 94903; \$494; CP/M; two disk drives required.

PEACHTEXT: Peachtree Software, 3 Corporate Square #700, Atlanta, GA 30329; \$500; CP/M.

IBM PC WP PROGRAMS

There's no shortage of word-processing programs for the IBM PC. Both **WordStar** and **Pie Writer**, mentioned above, are configured to run on the IBM. IBM's own word-processing program, **Easy Writer 1**, is an improved version of **Easy Writer**, which was originally published for the Apple. Better than both of these is **Easy Writer II**. It's great for screen formatting (with tabs, margin sets), and the hard copy printout is identical.

PFS: Write, a companion package to the popular **PFS: File** data-base program and other **PFS** programs, can merge data from these programs. It requires an IBM PC with 128K RAM, and two disk drives are recommended. One nice feature: What you see on the screen is what you get when you print.

The new word-processing program from Microsoft, the company that provided IBM's MS DOS operating program, is called **Microsoft: Word**. It's already considered one of the best around. You can work in eight different screen

"windows" at one time, allowing you to write from notes. And you can write in three columns.

One of the more popular PC programs, especially for those who don't need to merge mailing lists with their word-processing files, is **Volkswriter**. Since a lot of people use it, it's not hard to find help at a PC users group. And in the low-cost category there's **Wordvision**, a \$50 package.

EASY WRITER II: Information Unlimited Software; 281 Arlington Ave., Berkeley, CA 94707

VOLKSWRITER: Lifetree Software, Inc., 177 Webster St. #342, Monterey, CA 93940; \$195.

PFS WRITE: Software Publishing Corp., 1901 Landings Dr., Mountain View, CA 94043; \$140.

WORDVISION: Bruce & James, 4500 Tuller Rd., Dublin, OH 43017; \$50.

MICROSOFT WORD: Microsoft, 10700 Northup Way, Bellevue, WA 98004; \$395.

TI WP PROGRAMS

Shopping for a TI word-processing program is easy—you have only one choice. **Ti Writer**, a program in plug-in cartridge form, is published by Texas Instruments. Besides the cartridge, you need a disk to store text files. Peripheral expansion box, disk drive, and 32K RAM card

(\$550) required.

TI WRITER: Texas Instruments, P.O. Box 10508, Lubbock, TX 74908; \$99

MINI TI WRITER: Texas Instruments; \$19.95; on cassette; 4K mini-memory required.

TRS-80 WP PROGRAMS

When TRS-80 users talk about word processing, the program most often mentioned is **Scriptit**. This is mostly because the Radio Shack program has been around longer than most others, and has satisfied most everyone. It runs on the Model I, III, and 4, and, in the **Color Scriptit** version, on the Color Computer. It's not a fancy word-processing program—it has no HELP menus, cannot move a block of text, and is not particularly good on print formatting—but it's competent and dependable.

SuperScriptit, however, the newer, upgraded version, takes care of most of these drawbacks, and it has a HELP menu. Ditto for **Daisy**, a "patch" program designed to be used in conjunction with **Scriptit**. **Daisy** can handle very complex print formats, and is a must for those who want to create technical reports of any kind.

A more powerful program than **Scriptit**, and a great value at \$125, is **Newscrip**. Among other things, it has a built-in spelling-checker program, and allows you to print files in special character fonts. Underlining, boldface and other print formats are also available. **Newscrip's** power is easily harnessed, with its Primary Options Menu and various HELP menus. It's a well thought-out program.

Electric Pencil, one of the first word-processing programs ever published, is also good value for the money (\$79). It's been refined several times to keep up with the market, and can be thought of as TRS-80 users' answer to **Bank Street Writer**. Like **Scriptit**, it comes up in conversation, and don't overlook little **Zorlof**, which is slower than **Scriptit** but excels at print formatting.

DAISY: Med Systems Software, P.O. Box 3558, Chapel Hill, NC 27514; \$75; TRS-80 Model I, III, and 4.

ELECTRIC PENCIL: IJG Inc., 1953 W. 11th St., Upland, CA 91786; \$89; TRS-80 I, III, 4; available in cassette version for 16K machines.

NEWSSCRIPT 7.0: Prosoft Software; Box 839; North Hollywood, CA 91603; \$125; 48K Model I, III and 4.

SCRIPTIT: Tandy Corp., 1800 One Tandy Center, Ft. Worth, TX 76102; \$99; TRS-80 Model I, III, 4; Color Scriptit for Color Computer; \$39.95.

SUPERSCRIPSIT: Tandy Corp; \$199; TRS-80 Models I, III, and 4.

ZORLOF: Anitek, Box 361136, Melbourne, FL 32936; \$69.



PHOTOGRAPH BY JANET BELLER

A Young Girl's Fantasy Turns to Fortune

AS A CHILD, ROBERTA WILLIAMS WAS SCOLDED FOR CREATING STORIES. NOW HER IMAGINATION PAYS OFF IN COMPUTER ADVENTURES.

**BY
JAMES DELSON**

"WHAT'S FUNNY ABOUT MY SUCCESS IS THAT I USED TO GET INTO TROUBLE FOR TELLING STORIES. NOW I MAKE A LIVING AT IT."

Many of us dream of designing a hit computer game—just one in our lifetime. Thirty-year-old Roberta Williams has five games to her credit—all written in the past three years. Amazingly, between the time she was 10 and 26, she didn't even play, much less invent, any games.

"My first games career began and ended by age 10 with the playing of *Candy Land*," the designer told *FAMILY COMPUTING* contributing editor James Delson when they met recently. But Williams has risen like a phoenix out of the ashes of her 16-year hiatus from game playing to become one of the country's leading game designers, creating such adventures as *Time Zone*, *The Dark Crystal*, and *Mystery House*.

Born and raised in the suburbs of Los Angeles, Williams recalls that the high spots of her childhood were those times she would spin tall tales for her friends and relatives about her experiences playing *Candy Land*, the board game that leads children along a trail of gumdrops, lollipops, and other sweets to a gingerbread house. "If you really look at it, *Candy Land* is like an adventure game," says Williams. "You're going through this little fantasyland. When I told my friends and cousins these wild stories about my adventures there, they'd tell their parents, who would then call my parents to get them to stop me from making up such lies."

As Williams reached puberty, her interest in storytelling gave way to miniskirts and boy

chasing. She soon married, had two children, and worked briefly in various computer-related jobs. Her imagination took a rest for more than a decade, to be aroused when, at age 26, she discovered computer games. In the next three years she designed five trend-setting computer adventure programs.

Her credits read like a brief history of adventure games, beginning with her first program, *Mystery House*, which broke ground as the first illustrated adventure scenario. *Wizard and the Princess*, the first color graphics adventure game, led to the simpler Mission *Asteroid*. *Time Zone*, which fills six double-sided disks and more than 1,500 screens with 39 interlocking scenarios, is the biggest game ever manufactured, while *The Dark Crystal* was the first "adventurization" of a motion picture into a game. Now she has two new projects: *Family Circus*, based on the popular comic strip, and a new adventure program so top secret that she can't even disclose its title, although she will discuss some of its innovative elements. Williams and her husband, Ken, continue to revolutionize the field with programs from *Sierra On-Line*, the California-based software company they founded in 1980. "What's funny about my success now [is] I used to get into trouble for telling stories," Williams said. "Now I make a living at it."

FC: Why are adventure games so appealing to you?

Williams: Most computer games offer a way of

JAMES DELSON, the games critic for *FAMILY COMPUTING*, has written for *Psychology Today* and *Film Comment*, and is currently working on his eleventh screenplay.

escaping life, but adventures go further. They offer me the chance to tell stories.

FC: How old are kids who play adventure games?

Williams: Most kids from about nine and up enjoy them, but the puzzles require a thought process kids don't develop until they are about 11 or 12. Even my son, who's nine and has lived with adventure games since he was six, can't play alone. By about sixth grade, age level doesn't matter. It's the experience one's had in playing that counts.

FC: Computer games tend to be regarded as male-oriented activities. How can more girls and women get acquainted with them? How can you get someone to play who's simply not interested?

Williams: Well, I was that way until about four years ago. My husband used to bring home a computer terminal for his work. He would access the big IBM mainframe in downtown L.A., and then, when he'd finished his work, he'd play games like *Star Trek* and *Colossal Cave* (now *Adventure*). He kept trying to get me to play, but I didn't want anything to do with it. A lot of women don't understand computers, act bored by them, and are basically intimidated by seeing their husbands slaving over them night and day, so they're just turned off to the whole idea. But finally, like me, many of them kind of wander over when their husbands are playing and within five minutes they're hooked.

FC: Discovering *Adventure* was a turning point in your life?

Williams: It was amazing, because once I started playing it, I realized I'd been waiting my entire life for something like it.

FC: Did you become a fanatic?

Williams: I was up until three or four every night. I wasn't cleaning the house. I wasn't taking care of the kids. I would even go to bed thinking about how I could get past the dragon! When I finally solved it, I tried to find other good adventure games, but they didn't add up to what I thought they should be, so I figured I'd try and write one of my own.

FC: And that's how *Mystery House* came about?

Williams: Yeah, I just sat down and designed it. Then Ken programmed it and we took out an ad in *Micro* magazine to see if it might attract any public interest. We thought we might be able to make a little extra money on the side. We were amazed! It sold like gangbusters and gave us the money to start our own company.

FC: What motivated you to write *Time Zone* on so grand a scale?



In Time Zone, players travel through space and across seven continents, in eras ranging from 400 million B.C. to 4082 A.D.

Williams: I was always disappointed when adventure games ended. I wanted them to go on forever, the same way you feel about a really good book or movie. So I tried to write an adventure game that would go on for a long time.

FC: What is the playing time for a complete game of *Time Zone*?

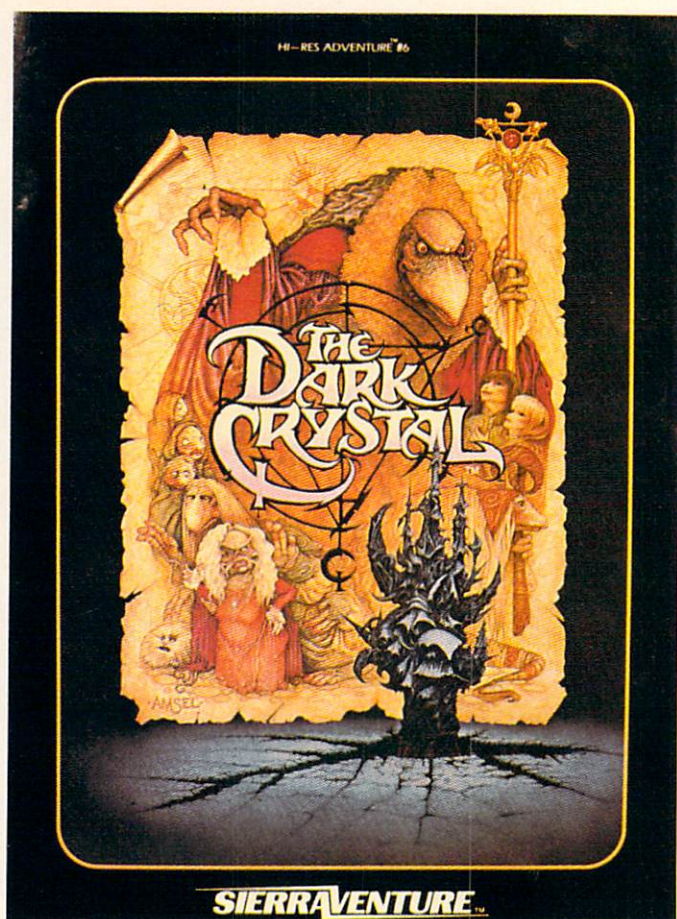
Williams: I figure that the average computer game player spends about 10 hours a week at the keyboard. At that rate it would take about six months to finish *Time Zone*. If I had to do it over again I might only make it half the length it is. But I'm glad I did it because not many people can claim to have done anything like it. It's sort of the adventure game's answer to Cecil B. DeMille's *The Ten Commandments*. Not that many people are going to try and play it, but when they do, it'll be something they'll remember for a while.

FC: Are adventure games best played by groups or single people?

Williams: It really depends on personal preference. Some people like to shut themselves up in a room and play. They don't want to be bothered. Others wouldn't think of playing without somebody else there. It's almost as if the shared experience were as important as the game.

FC: Do you worry about some people lifting your game ideas for their own programs?

"TO EVEN WANT TO PLAY ADVENTURE GAMES YOU'VE GOT TO ENJOY READING AND HAVE SOME SORT OF IMAGINATION."



Williams: Let me start off by saying that I don't know how to program, which has hurt me, but which we have managed to work around by my being able to supervise each game from beginning to end. Anyway, the first thing I do is think up the game's concept. Then I draw the "map" of the game board. It's a very basic map, limited to defining the areas that the player will pass through on the adventure. I just map out where you can go, then decide what the places are that you're going to. Now, what's going to happen to you? Well, as in *Time Zone*, having a witch swoop down on you in the streets of London a hundred years from now is illogical, so that's out. But there'll still be cars, so you can get run over if you cross the street without going with the green light. I create "puzzles"—anyplace you get stuck—and they can be as easy (to solve) as opening doors or as complex as having to make a series of decisions in the proper order.

FC: What does the map look like as you get into more advanced stages of planning?

Williams: A mess. But I can tell by looking at it, without any words or any other material, what's going on. That way I can fix any faults or problems there are before I start writing. I write page after page, room by room, exactly what is supposed to happen. The programmers have to totally understand the game, so I can't leave anything out. It's like writing a book. Everything has to be defined: the pictures as they should appear on the screen, every possible move the player can make, every message, everything the player might want to say in that room, descriptions of each room, everything.

FC: What about room descriptions? Have you abandoned that style in the new game you're working on?

Williams: Yes. That's a big difference. By eliminating the description we had to improve the picture; and that paid off for us. The pictures are better than anything we've ever done. It doesn't say where you are. It just assumes that you can see where you are and what's around you.

FC: Do you ever go back and make changes once the "book" is finished?

Williams: Only if it's absolutely necessary. Because once you make one tiny little change in a game like that ...

FC: You get a ripple effect, where everything it touches has to be changed as well?

Williams: Yeah. I don't like to get into that.

FC: How do you approach the problem of rules complexity in designing your games?

Williams: I decide who the game's for and take it from there. All the games I've done before have been for adults, so the rules were tailored for them. Children have been in the back of my mind, however, with the wish that

Inspired by Jim Henson's animated movie, *The Dark Crystal* explores the battle between the good Gelflings and the evil Skeksis.

"I DON'T KNOW HOW TO PROGRAM, WHICH HAS HURT ME."

Williams: I can't be concerned about what other people do. It's a fact of life in this business that if you do something new or good there will be a number of clones following it onto the market. It happened with *Mystery House* and *Wizard and the Princess*, and probably will happen with all our new games as they come out as well. I just believe that you do what you do, and nobody else can do what you do better. It comes down to technique, crafting the puzzles, and, basically, how interesting the whole game is. That can't be passed on to anyone else. That's in your mind, so I don't worry about it.

FC: You've come so far in such a short period of time. Do you wonder about what lies ahead, or do you have your future mapped out?

Williams: About two years ago things were kind of scary. We thought we'd created this animal we couldn't control. It was almost as if it was growing in spite of us. Now we've been around three and a half years and we're more sensible and practical about things. It's an industry that has so much pressure on you to create and be good and stay one step ahead of everybody else that you don't often have time to reflect any more on what's happened or what's going on. All we think about are everyday pressures.

FC: Can you describe your work habits in creating an adventure?

they could grasp everything. The game I'm designing now is called *Family Circus*, based on the cartoon strip of that name. It's for children 10 to 17, so I have to think of simplicity.

It's really three separate games, each involving one of three kids in the strip: Dolly, Jessie, and Billy. The rules are the same for all three games, but they're on different difficulty levels, depending on the age and skills of the player. For example, with Dolly, the game teaches you how to go through the house, find your things, pick them up, and figure out where they should be put away in the right place.

FC: Is it a fantasy game?

Williams: No, each of the games revolves around the house and the back or the front yard. So if you're Dolly you can: 1) jump on your parents' bed; 2) look under the bed; 3) leave the room; or 4) look out the window. Depending on the number chosen, different things will happen.

FC: Is there a point system?

Williams: No, the payoff is a happy face for the right place and sad faces for the wrong places. If you're Jessie, you have to learn right from wrong, and if you're Billy, it gives you chores to do, and you have to do them correctly with the right items. There's very simple puzzle solving in the game, but it's more or less given to them on a silver platter.

FC: What can you say about your other new game?

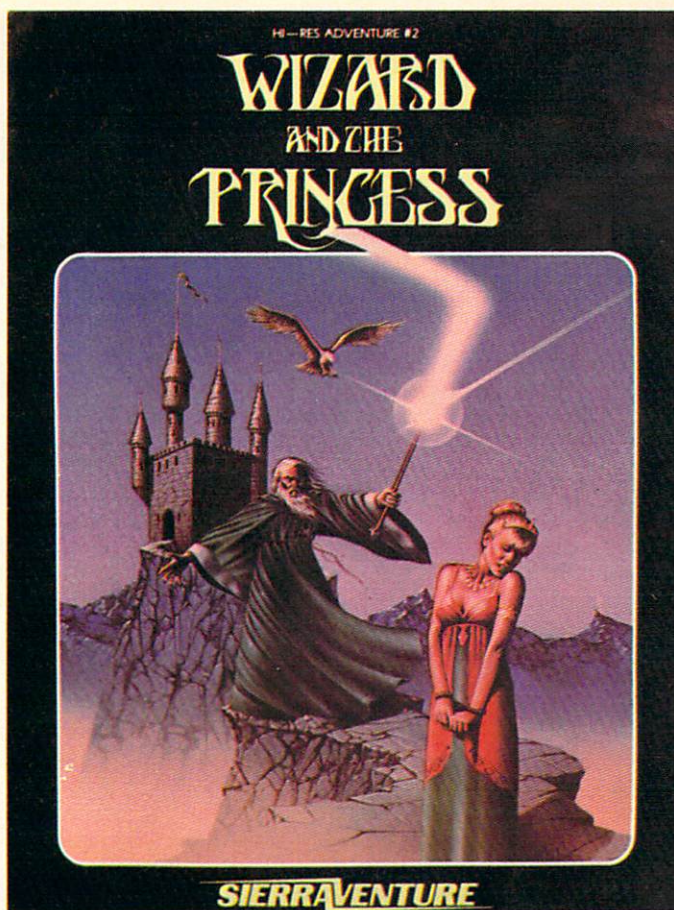
Williams: It's a totally animated program, so far beyond what's available on the market today that there's only one computer capable of handling it at this time, and I'm not permitted to say which one. Your character can duck, walk, climb, jump, swim, run, leap, crawl, stoop, throw things, and shoot a bow. It has 3-D effects, so you can go behind objects or walk in front of things. You still type into it, talk to it, and it talks back. But now there are full sentences, instead of just two words.

FC: When you say fully animated, does that mean if you tell your character to walk, it keeps walking until you tell it to stop?

Williams: Yes. And there are other characters in the game, both bad and good, whom you encounter and have to deal with immediately, because the game's in real time. Everything happens as you see it. So if you happen upon an ogre, you can run away, hide behind a rock, or do something else. But you've got to deal with it instantly, or you're killed. People are going to be killed a lot in this game when they're learning how to play it.

FC: What other characters do you face?

Williams: There are four or five bad guys, each with their own personalities, abilities,



and character traits. The ogre's slow, so you can run away from him. The witch swoops down on her broom and tries to get you, so you have to duck and dodge or hide behind a tree to evade her. If you're chased by a wolf you have to climb a tree, because they can't.

FC: Some of the adventure games I've played are so frustrating that I just want to get up and walk away forever. How do you approach the question of frustration when designing a game?

Williams: That's one of the biggest things to know how to do, and I'm not sure where it comes from. With me, it's intuition. But I'm also committed to the idea of being completely logical. If you just sit and think things out in my games, the answers are always logical. How could you open a door if you didn't have a key? Use a credit card, or a hair pin if you bent it. Try to think of ways of doing things that aren't the normal way, but that still are possible. Things in my games are always there right in front of your nose. People may have a tendency not to look where it's most obvious. They want to make it harder on themselves.

FC: What is the relationship between the game designer and the player?

Williams: They're adversaries. Wits versus wits. I try to thwart the player as much as possible, but without being too bad. Give 'em a little challenge, a little fun, then let 'em win. **FC**

Wizard and the Princess, the first graphic adventure in color, was the only computer game to remain on Softalk's bestseller list for more than a year.

"I TRY TO THWART THE PLAYER AS MUCH AS POSSIBLE, BUT WITHOUT BEING TOO BAD."

BUYER'S GUIDE TO JOYSTICKS, PADDLES, AND TRAK-BALLS

WITH 24 "PLAY-TEST" REVIEWS

"GIVE ME BUT LEVER AND PLACE TO
STAND, AND I SHALL MOVE THE
WORLD."

—ARCHIMEDES (CIRCA 250 B.C.)

As computers become ever more complex and powerful, it is a group of fairly simple devices that are placing this power in human hands. Handheld controllers—paddles, joysticks, trak-balls, and other more specialized instruments such as "mice"—are changing the way we interact with computers.

The language of hand control is graphic, fluid, and versatile. Primarily designed for use with game and graphics programs, these simple devices allow you to move objects, to point at objects, and to choose among alternatives (on a menu, say), far more efficiently than a keyboard does.

In this month's Buyer's Guide, we examine the current crop of hand controllers, learn how the major types work, what they can do, and how to choose the right controller for a particular computer and application.

BASIC CONSIDERATIONS

Almost every popular brand of computer can use several classes of hand controller. However, a given controller is usually not compatible with more than one brand of computer (though Atari and Commodore computers can use the same types of joysticks and paddles). In certain cases, controller/computer incompatibility can be overcome by purchasing an adapter. Nonetheless, before you buy you should make sure that the controller you want works with your computer.

Remember to check for software compatibility too. Most published software is controller-specific—a program will be designed to handle input from one class of controller (paddle, joystick, trak-ball, etc.) and no other. A note on the software package will almost always state what kind of controller a program requires. You should test a variety of controllers with the kind of software you intend to use before buying one.

PADDLES

Paddles, also called "pots," are the oldest and simplest of controllers. Their name derives from association with the granddaddy of video games, *Pong*, which used comparable knob-type controls. Now, paddles are best used for "slide and shoot" action games, such as *Space Invaders*.

Turning the paddle knob a certain number of degrees causes the screen object to move in a straight line—either side-to-side or up-and-down. Alternatively, the number signals produced by a paddle can also serve as numeric input. For example, certain programs use paddles to indicate the frequency of musical notes or set the angle at which three-dimensional graphic images will be displayed.

The game controller ports of most popular computers can each support a pair of paddles. Thus, paddles are generally sold in pairs, two handheld units connected by a "Y" cable to a single plug. Right-handed paddle sets (with

the fire button on the right) are easier to find than left-handed ones, though several manufacturers produce double-button "lefty-righty" versions.

When shopping for paddles, look for units that can be held comfortably in the palm with the thumb laid out straight over the fire button. Having to press the button repeatedly with the tip of a bent thumb can strain ligaments and cause discomfort.

The proper size for a paddle knob depends on the uses to which the paddle will be put. For action games, a larger knob may be better because it can be rolled with the palm more quickly from one end of its range to the other. For nonaction games, pointing games, and graphics applications, a small knob, which can be turned in tiny increments with the fingertips, may offer more control.

Signs of a high-quality paddle include: a knob that turns smoothly, without friction; a firm, tactile button press; construction with screws instead of glue; and good sealing at the joints to protect against dust.

JOYSTICKS

Joysticks—here, there, everywhere. Their name derives from a British slang term used to describe the control rod of an airplane. And, internally, the modern joystick is a direct descendant of the miniature remote control units used by model airplane hobbyists since the early 1960s. And it has moved from the arcade into the home.

There are two types of joystick on the market: **analog** and **digital**, otherwise known as pot-type and switch-type. Atari, Commodore, and TI computers use digital joysticks; Apple, IBM, and Radio Shack micros use the analog variety.

Digital Joysticks. The control afforded by a digital joystick is limited to eight directional signals, plus the signal from the fire button. Digital joysticks cannot control the absolute position of a screen object or its speed.

Many different styles of digital joystick are available, the majority designed for compatibility with Atari and Commodore computers. Most can also be used with a TI-99/4A, but require a plug-adaptor. Prices for these controllers range from under \$10 to more than \$100; and you can choose from a dizzying array of features enhancing responsiveness, user comfort, and durability.

Responsiveness in a digital joystick is largely a matter of **switch speed**—the ease, rapidity, and accuracy with which one or two of the four built-in switches can be closed by pressing the stick. This translates in practical terms to the amount of time it takes to set into motion an object on the screen in a given direction.

Switch speed depends less on the type of switch used than on the design of the linkage between the switch and the base of the handle. Inexpensive joysticks usually have a simple linkage, the base of the shaft pressing more or less directly on the switches themselves. Sticks of this type

1. Wico Bat-Handle "Atari-style" Joystick; 2. Wico Boss Joystick; 3. TG Products Apple Trak-Ball; 4. Wico IBM Joystick; 5. TG Products "Atari-style" Enjoystick; 6. TG Products Apple/IBM Joystick.



are generally less responsive than sophisticated models such as the Kraft Switch-Hitter, which employ more sensitive floating or lever linkages between shaft and switches.

Complex linkages can also give a digital stick more "play"—allowing it to be pressed over further before encountering resistance. Stiffer sticks tend to cause fatigue, forcing the hand holding the shaft to fight against the hand steadying the joystick's base.

In addition, a stick with some play is less susceptible to shaft breakage than stiffer models. The life expectancy of digital sticks may also be enhanced by designing wear-prone parts, such as the shaft, in durable materials like steel, rather than the customary nylon and plastic. This also gives sticks an appealing heft and balance.

Additional features that may contribute to a stick's performance include multiple fire buttons, interchangeable grips, suction cups for tabletop mount, rapid-fire options, and calibration controls for adjusting shaft play and trigger sensitivity.

Analog Joysticks. Analog joysticks have a much smaller shaft than digital joysticks, and it is connected by a ball-and-socket or other "floating" arrangement to a pair of potentiometers. The resulting double signal can control a screen object's position *and* speed. The ball-and-socket arrangement allows the stick-free motion through a full 360 degrees.

Judging the responsiveness of an analog joystick involves measuring how much of this wide vertical deflection is actually significant to control. Some very responsive models, such as the Kraft Apple-compatible joysticks, produce their entire range of values within a few degrees of the center position. Moving the stick beyond this radius causes no further response on the screen. Sticks of this type are generally preferred for arcade-type games requiring rapid motion, though they suffer in fine control.

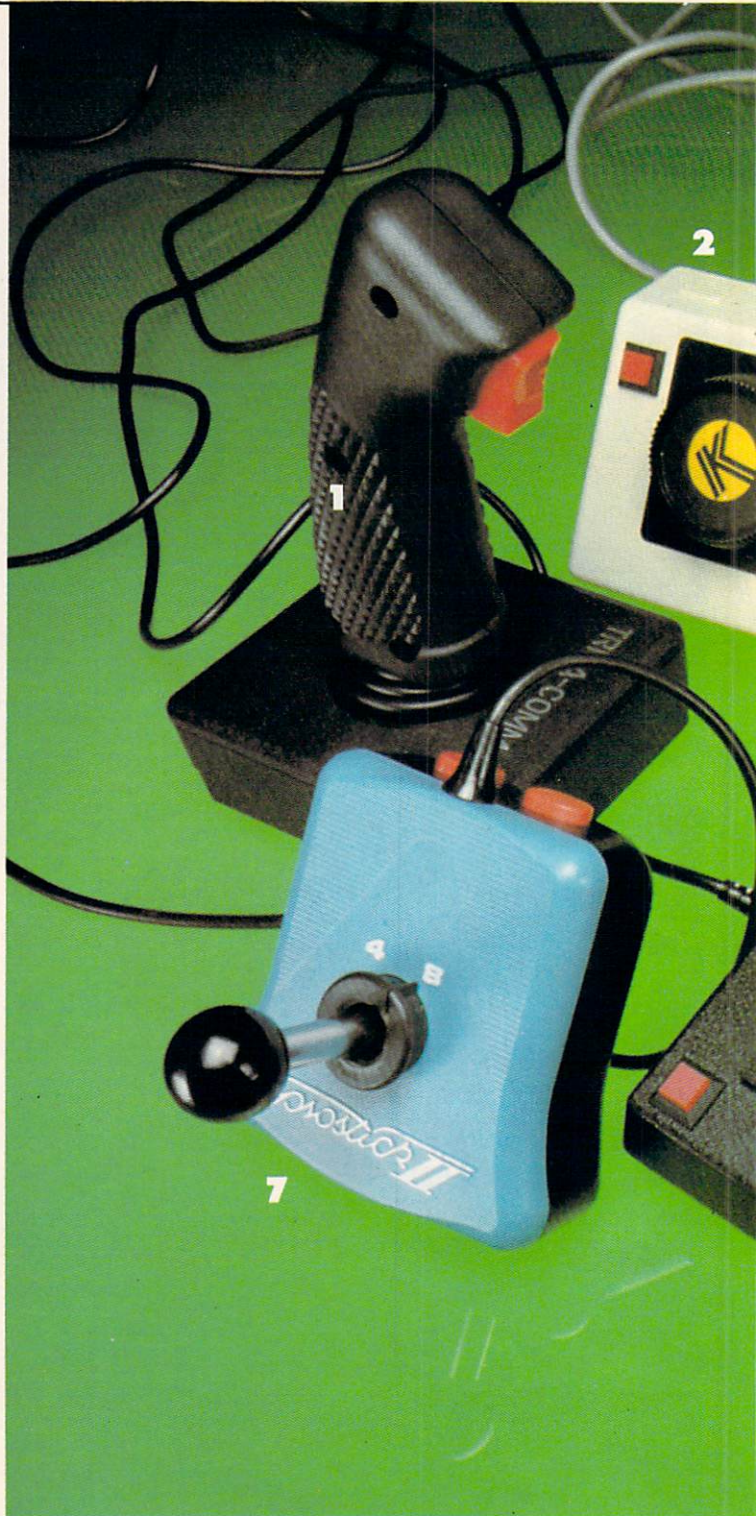
Other less-responsive analog sticks spread their range of values more evenly over a wider deflection, slightly decreasing the speed with which a screen object can be moved from one position to another, but proportionally increasing sensitivity and fine control. This type of stick is preferable for graphics applications.

Unlike a digital joystick, which is "null" only in the upright centered position, an analog joystick ceases to affect a screen object when the stick itself is not in motion. Thus self-centering, an assumed feature on digital sticks, may be considered a significant option on analog models. Most of the better analog sticks offer user-selectable self-centering, allowing the centering feature to be engaged for games and the like, and disengaged for freer use with graphics and similar applications. Joysticks that offer this option often offer user-adjustable electronic calibration as well, by which the user can align the electronic response of the stick to correspond to its physical behavior in a variety of ways.

Since the shaft of an analog joystick moves freely through a wider radius, it is not nearly as susceptible to fracture as that of a digital joystick, nor does it contribute significantly to fatigue. We find that the comfort of using an analog stick depends almost wholly on the design of the base and the position of the buttons, and that larger bases are somewhat more comfortable to hold in extended use.

Fire Buttons; Table Mounts. For gaming, we prefer sticks that have base-mounted buttons to those with buttons on the handle. The separation of positioning and firing motions seems to aid accuracy, though in some very fast-moving games a player might wish to have the option of engaging a shaft-mounted button to take advantage of the one-hand, grip-and-fire reflex.

Opinions run the gamut on the issue of table-mounted vs. handheld joysticks. In certain play tests, handheld sticks, particularly those with shorter grips, came out con-



1. Triga Command "Atari-style" Joystick; 2. Kraft Apple Paddles; 3. Amiga "Atari-style" Powerstick; 4. Kraft Apple Joystick; 5. Atari 2600 Joystick; 6. Wico Command Control Trak-Ball; 7. Newport "Atari-style" Prostick II (Texas Instruments adapter); 8. Kraft Switch Hitter "Atari-style" Joystick; 9. Atari Paddles; 10. Datasoft "Atari-style" Le Stick; 11. Discwasher "Atari-style" Pointmaster

sistently better. Three-dimensional games, such as *Zaxxon*, seem particularly well suited to handheld joystick control. The reason for this, we feel, is that the unusual perspective of the game is easier to master when one's joystick is not locked into a perpendicular position. Then again, table-mounted joysticks seemed to do better for 2-D scrolling games, such as *Fort Apocalypse* or *Pac-Man*.



TRAK-BALLS

In addition to the conventional joysticks and paddles, manufacturers have created a number of alternative controller designs for special markets and applications. Most alternative controllers are designed to electrically emulate conventional devices—that is, they look to the computer like a joystick or a paddle, while affording the user a special means of physical interaction or control.

Many controller alternatives are arcade clones, copies of the input devices peculiar to certain top-rated video games. The trak-ball is an example of such a device. It was first made popular in the arcades by games such as *Missile Command* and *Centipede*, but is now finding use as a more general input tool.

The simplest kind of trak-ball emulates an analog joystick, except it has a sphere-shaped actuator. Devices of this type, produced for Apple and IBM by Wico, offer extraordinary speed and accuracy of control. Other models, such as the Wico trak-ball for Atari and Commodore computers, allow less control over positioning, speed, and accuracy. And Radio Shack's **Color Computer Mouse** functions as an upside-down trak-ball, which you roll across a flat surface.

Trak-balls are compatible with joystick software, but are suited to a narrower range of applications. Because a trak-ball must be in motion in order to move a screen object, it is best suited for use in situations requiring precise motion over fairly limited distances.

PLAY-TEST REVIEWS OF CONTROLLERS FOR APPLE, ATARI, COMMODORE, IBM, TRS-80, AND TI MICROS

The controllers outlined below were tested several times by several reviewers. In evaluating joysticks and trak-balls, four types of software were used in order to get a feel for the controller in different types of applications. 1) A continuous-motion, fine-scrolling game. Example: *River Run*. This kind of game tests overall responsiveness, lateral positioning control, and trigger response; 2) a maze-type game. Example: *Pac-Man*. Tests utility of a controller in four-way format, i.e., vertical and horizontal motion only—no diagonal; 3) an eight-way arcade game. Example: *Final Flight*. Tests general accuracy of control in eight

directions, accuracy with which a controller registers the diagonal signal; 4) a graphics application program. Example: *Pinball Construction Set*. Tests fine positioning control. Trak-balls were also tested with games like *Missile Command* and *Centipede*, which were originally designed for trak-ball control.

Paddles are supported by a fairly limited library of software, probably because joysticks have supplanted them in recent years as the controllers of choice. The paddles evaluated here were tested with a variety of programs from FAMILY COMPUTING's library.

ATARI/COMMODORE/TI

Digital Joysticks

PRODUCT: 2600
COMPANY: Atari
HANDEDNESS: Right
CONSTRUCTION: Average to flimsy
HANDLE: Medium-size
TRIGGER(S): One, base-mounted left side for thumb press. Adequate firing speed.
ACTION: Stiff
COMFORT: Poor in extended play
OVERALL PERFORMANCE/ APPLICATION: Good. Best in eight-way arcade and continuous fine-scrolling.
PRICE: \$9.95
COMMENT: The standard. Handle sized appropriately for both children and adults. You can't go wrong.

PRODUCT: VIC Joystick
COMPANY: Commodore
HANDEDNESS: Left/Right
CONSTRUCTION: Flimsy
HANDLE: Medium-size
TRIGGER(S): One, base-mounted, center, for thumb press. Average response.
ACTION: Stiff
COMFORT: Poor
OVERALL PERFORMANCE/ APPLICATION: Average. Four-way maze best.
PRICE: \$8.95
COMMENT: Look elsewhere.

PRODUCT: 8-Directional Controller
COMPANY: Texas Instruments
HANDEDNESS: NA*
CONSTRUCTION: Fairly robust
HANDLE: Medium-size
TRIGGER(S): One, shaft-mounted for thumb press
ACTION: Average to stiff
COMFORT: Fair
OVERALL PERFORMANCE/ APPLICATION: Fair. Best on four-way maze games. Poor fine positioning.

* NA means that the fire button is on the center shaft, thus making the controller suitable for right- or left-hand action.

PRICE: \$34.95 pair
COMMENT: Joysticks come two to a set, with a single unified plug. Incompatible with Atari and Commodore.

PRODUCT: Pointmaster
COMPANY: Discwasher
HANDEDNESS: NA*
CONSTRUCTION: Fairly robust
HANDLE: Large pistol grip
TRIGGER(S): One, shaft-mounted for thumb press. Allows rapid firing.
ACTION: Fairly loose
COMFORT: Fair, judged difficult to hold by some
OVERALL PERFORMANCE/ APPLICATION: Good. Eight-way arcade.
PRICE: \$16.95.
COMMENT: Poor fine positioning. Gives no real feeling of control.

PRODUCT: Switch Hitter
COMPANY: Kraft Systems
HANDEDNESS: Left/Right
CONSTRUCTION: Fairly robust
HANDLE: Small
TRIGGER(S): Two (l/r) base-mounted for thumb press. Response good.
ACTION: Quite loose
COMFORT: Excellent
OVERALL PERFORMANCE/ APPLICATION: Good. Poorest in graphics, best in eight-way arcade.
PRICE: \$19.95
COMMENT: Extremely responsive—takes some time getting used to. Base sized very well.

PRODUCT: Le Stick
COMPANY: Datasoft
HANDEDNESS: NA*
CONSTRUCTION: Quite robust
HANDLE: Medium-size (see comment)
TRIGGER(S): One, shaft-mounted for thumb press
ACTION: (see comment)
COMFORT: Fair
OVERALL PERFORMANCE/ APPLICATION: Average. Best in continuous fine-scrolling games.
PRICE: \$24.95

COMMENT: Baseless joystick activated by gravity switches when stick is tilted. Requires too much wrist action for positive directional control. Fine control is poor. Stick inappropriate for applications requiring reliable self-centering. Stick locks in current direction if squeezed—supposed to be a feature, but looks more like a bug.

PRODUCT: Prostick II
COMPANY: Newport
HANDEDNESS: Left/Right
CONSTRUCTION: Very robust
HANDLE: Short, ball end
TRIGGER(S): Two (l/r) base-mounted on front for index-finger press.
ACTION: Average to stiff
COMFORT: Good. Base is well shaped.
OVERALL PERFORMANCE/ APPLICATION: Good. Fine positioning excellent. Good for four-way maze, eight-way, graphics.
PRICE: \$24.95
COMMENT: A very nice stick. Can switch from four-way to eight-way action. TI Adapter available.

PRODUCT: Command Joystick
COMPANY: Triga
HANDEDNESS: NA*
CONSTRUCTION: Very robust
HANDLE: Very large, knurled rubber grips
TRIGGER(S): One. Shaft-mounted for index-finger press. Very fast response.
ACTION: Average to loose
COMFORT: Fair. Some complain that knurled grips hurt their hands.
OVERALL PERFORMANCE/ APPLICATION: Good. Surprisingly accurate fine-positioning. Best for continuous fine-scrolling and eight-way arcade.
PRICE: \$15.95

COMMENT: An unusually large handle may make this stick inappropriate for young

children. Pistol-type trigger makes it look like a weapon.

PRODUCT: Bat Handle
COMPANY: Wico
HANDEDNESS: Right, NA* (see trigger)
CONSTRUCTION: Robust
HANDLE: Large, bat-shaped
TRIGGER(S): Two. One base-mounted for thumb press (right hand), one shaft-mounted for thumb press. Switch selectable.
ACTION: Quite loose
COMFORT: Good
OVERALL PERFORMANCE/ APPLICATION: Good. Best for eight-way arcade.
PRICE: \$29.95
COMMENT: A real arcade-quality stick. Wico has two other versions of the same basic design: one with a ball-handle shaft (Red Ball), the other with interchangeable grips (3-Way). Some find base of stick difficult to hold for extended periods.

PRODUCT: Enjoystick
COMPANY: TG Products
HANDEDNESS: Left/Right (see comment)
CONSTRUCTION: Fairly flimsy
HANDLE: Small
TRIGGER(S): One, base-mounted on side for thumb press. Trigger unit may be reversed for left-handed use.
ACTION: Loose
COMFORT: Good. Hexagonal base is easy to hold.
OVERALL PERFORMANCE/ APPLICATION: Good. Best on eight-way arcade.
PRICE: \$29.95
COMMENT: Reversible trigger is nice idea, but could be better designed. Reversing the trigger briefly exposes wiring in the interior of the stick. If switch is made frequently, this may contribute to shortening the product's life.

PRODUCT: Powerstick
COMPANY: Amiga
HANDEDNESS: Left/Right

CONSTRUCTION: Fairly robust
HANDLE: Very small
TRIGGER(S): Two, base-mounted on sides for thumb press
ACTION: Very loose
COMFORT: Too small for adults to use comfortably. Perfect for kids.

OVERALL PERFORMANCE/
APPLICATION: Fair. Best in continuous fine-scrolling. Graphics poor.

PRICE: \$9.99

COMMENT: A good stick for children. Joystick does not self-center, which can be troublesome in fine-positioning applications. A pair of the same sticks, plus compatible to TI, is available for \$19.99.

PRODUCT: **Quick Shot**

COMPANY: Spectravideo

HANDEDNESS: Right/NA*

HANDLE: Large, pistol-grip

CONSTRUCTION: Fairly robust

TRIGGER(S): Two, one base-mounted for thumb press, the other shaft mounted for thumb press

ACTION: Quite stiff

OVERALL PERFORMANCE/
APPLICATION: Fair. Best for eight-way games.

PRICE: \$18.95

COMMENT: An average stick. Knurled base makes it fairly easy to hold. Unusually stable in table mount.

Digital Trak Balls

PRODUCT: **Trak-Ball**

COMPANY: Wico

HANDEDNESS: Right

CONSTRUCTION: Very robust

TRIGGER(S): One button, mounted flush with top panel for thumb or index finger press.

COMFORT: Very good. Ball rolls smoothly and unit may be held in hand or placed on table.

OVERALL PERFORMANCE/
APPLICATION: Good. Fine positioning quite good. Best for eight-way games and graphics.

PRICE: \$49.95

COMMENT: Within its range, an excellent controller. Wico also makes a version of this ball that is plug-compatible with TI.

PRODUCT: **Accuball Controller**

COMPANY: Accutronics

HANDEDNESS: Right

CONSTRUCTION: Average

TRIGGER(S): One top-mounted button for thumb or index-finger press

COMFORT: Fair. Ball does not roll very smoothly when unit is handheld.

OVERALL PERFORMANCE/
APPLICATION: Fair. Fine positioning erratic. Best for

eight-way games.

PRICE: \$24.95

COMMENT: A fairly good trackball. Number two in a field of two.

Paddles

(The TI computer is not paddle-compatible.)

PRODUCT: **Paddle Pair**

COMPANY: Atari

HANDEDNESS: Right

CONSTRUCTION: Fairly robust

TRIGGER(S): One per unit. Side-mounted for thumb press.

COMFORT: Very good. Unit is rounded to fit in palm.

OVERALL PERFORMANCE/
APPLICATION: Good. Accuracy of positioning quite precise and does not waver.

PRICE: \$14.95 pair.

COMMENT: A good paddle. Suitable for a range of applications.

APPLE/IBM/TRS-80 COLOR

Joysticks

PRODUCT: **Apple IIe Joystick**

COMPANY: Apple Computer

HANDEDNESS: Right

CONSTRUCTION: Robust

TRIGGER(S): Two, base-mounted for thumb press. Quite responsive.

HANDLE: Small, steel shaft, plastic-tipped

ACTION: Quite smooth. Good, even pressure against centering springs.

COMFORT: Very comfortable to use. Base is well-sized for hand.

OVERALL PERFORMANCE/
APPLICATION: Good. Fine control, fair. Best for continuous-scrolling games.

PRICE: \$59.95

COMMENT: Attractively styled to match Apple IIe console. Plug fits external joystick port on IIe. User-adjustable centering and electronic calibration.

PRODUCT: **Apple/IBM/CoCo Joystick**

COMPANY: Kraft Systems

HANDEDNESS: Right

CONSTRUCTION: Very robust

HANDLE: Short, metal shaft. Knurled tip.

TRIGGER(S): Two, base-mounted. One on top for thumb press, other on front for index-finger press. Very responsive. Color coded.

ACTION: Excellent.

COMFORT: Extremely comfortable to hold. Roughened surface keeps grip firm. Top panel of unit tilted back for table mount.

PRICE: \$64.95

PRODUCT: **Apple/IBM Joystick**

COMPANY: Wico

HANDEDNESS: Right

CONSTRUCTION: Robust

HANDLE: Large, knurled plastic
TRIGGER(S): Two. Base-mounted on top for thumb press. Buttons size-coded.

ACTION: In self-centering mode, somewhat stiff. In free mode, somewhat loose.

COMFORT: Very comfortable.

Finger notch in base for firm grip.

OVERALL PERFORMANCE/
APPLICATION: Good. Large stick makes game play easier, particularly for fast-moving eight-way games.

PRICE: \$49.95

COMMENT: Adjustable self-centering. An interesting stick. Arcade quality for Apple and IBM.

PRODUCT: **Radio Shack Joystick**

COMPANY: Tandy Corporation

HANDEDNESS: Right

CONSTRUCTION: Fairly flimsy

HANDLE: Turned metal shaft

TRIGGER(S): One, base-mounted for thumb press.

ACTION: Smooth

COMFORT: Fair. Unit well-sized to hand.

PERFORMANCE: Good. Best for eight-way arcade games.

PRICE: \$39.95

COMMENT: Selectable self-centering and electronic calibration. Far better than the last generation of CoCo joysticks.

PRODUCT: **Apple/IBM Joystick**

COMPANY: TG Products

HANDEDNESS: Right

CONSTRUCTION: Average

HANDLE: Small, metal shaft. Plastic tip.

TRIGGER(S): Two. Both top-mounted for thumb press.

ACTION: Fair, lacking somewhat in smoothness

COMFORT: Fair. Square case somewhat difficult to hold.

OVERALL PERFORMANCE/
APPLICATION: Average. Best for eight-way games. Fine positioning only fair.

PRICE: \$59.95

COMMENT: Selectable self-centering. Adjustable centering. An adequate replacement joystick. Plug fits internal game I/O socket on II plus/IIe.

ACTION: Very smooth. Ball spins well in bearings.

COMFORT: Good. Unit is light enough to be held in hand or placed on lap.

OVERALL PERFORMANCE/
APPLICATION: Good. Best for graphics.

PRICE: \$89.95

COMMENT: Best of the Apple trak-balls. Works with CoCo.

Trak-Balls

PRODUCT: **Command Control**
COMPANY: Wico

HANDEDNESS: Right

CONSTRUCTION: Robust

TRIGGER(S): Two, base-mounted for thumb press. Size-coded.

OVERALL PERFORMANCE/
APPLICATION: Very good. Best for eight-way games.

PRICE: \$64.95

COMMENT: User-selectable self-centering, user-adjustable centering. Very responsive stick. Requires some getting used to. May be too responsive for effective graphics use. Plug fits internal game I/O socket on II plus/IIe.

PRODUCT: **TG Apple Trak-Ball**

COMPANY: TG Products

HANDEDNESS: Right

CONSTRUCTION: Robust

TRIGGER(S): Two. Top-mounted in recess for thumb press.

ACTION: Fair. Ball moves somewhat roughly on bearings.

COMFORT: Good. Recess mounting of buttons prevents hands from interfering with one another in use.

OVERALL PERFORMANCE/
APPLICATION: Fair. Ball has insufficient freedom of movement. Best for graphics.

PRICE: \$59.95

COMMENT: A nice-looking ball. Recessed buttons are a good idea.

Paddles

PRODUCT: **Apple Paddle Pair**

COMPANY: Apple

HANDEDNESS: Right

CONSTRUCTION: Robust

TRIGGER(S): One per unit, side-mounted for thumb press

ACTION: Good, knob movement very smooth

COMFORT: Very Good. Unit shaped and sized to fit well in palm.

PERFORMANCE: Good. Fine positioning is positive and does not vary.

PRICE: \$34.95

COMMENT: A good paddle. Shape of unit is well thought-out.

PRODUCT: **Kraft Apple/IBM Paddle**

COMPANY: Kraft Systems

HANDEDNESS: Right

CONSTRUCTION: Very robust


TRIGGER(S): One per unit, base-mounted for thumb press

ACTION: Good. Smooth rotation.

COMFORT: Good. Rough surface grips easily. Top panel tilted back for tabletop mount.

PERFORMANCE: Good. Fine positioning is excellent.

PRICE: \$49.95

COMMENT: An elite paddle for the Apple 

Automatic Pilot

YOU CAN FOLLOW THE LEAD OF THESE FOUR HOMEOWNERS WHO'VE USED EASY-TO-INSTALL EQUIPMENT TO TURN SCIENCE FICTION INTO FACT. SOON ENOUGH, HOME CONTROL MAY EVEN BE PRACTICAL.

BY LESTER BROOKS

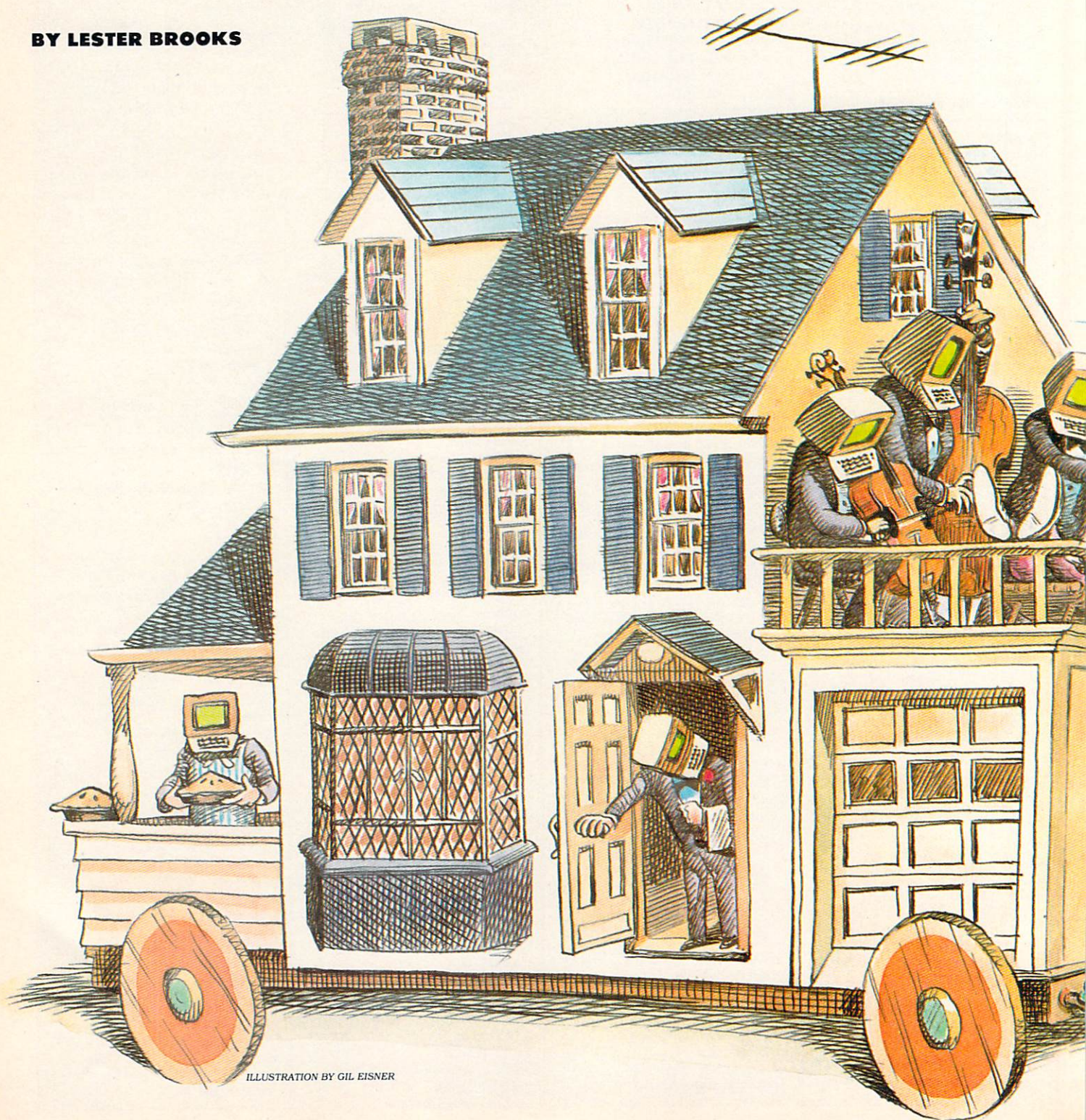


ILLUSTRATION BY GIL EISNER

The tantalizing aroma of sizzling bacon, hot toast, and freshly brewed coffee—all prepared automatically—tickles the nose of Allan Ginsberg even before the lights go on and his radio alarm nudges him fully awake each morning. Ginsberg's day gets off to a predictably tasty start for he has harnessed his house to his computer. Besides preparing breakfast, the computer executes an extraordinary range of chores for the young, single executive from Bethesda, Maryland.

Electronic pioneers like Ginsberg have taken a giant step toward 21st-century living by turning over to their computers repetitive, easily forgotten, or simply tedious tasks. While computerized home control is still in its infancy, and still somewhat short of practical, some of today's applications hint at the time- and money-saving possibilities for the future.

With today's readily available hardware and software, your computer can turn lights on and off, control heat and air-conditioning, start appliances doing such diverse chores as cooking dinner, washing clothes, warming a hot tub, and watering the lawn. Some computers have been turned into electronic nannies, rocking cribs or dimming lights in children's rooms. Computers are also being used for sentry duty, where sensors detect intruders, and for theft prevention, as specially programmed lights and radios turn on and off to mislead burglars into believing the family is at home instead of away on vacation. Computers are even capable of phoning the police to report burglaries in process.

Until about four years ago, home control was the domain of electrical engineers and electronics nuts. They assembled their systems

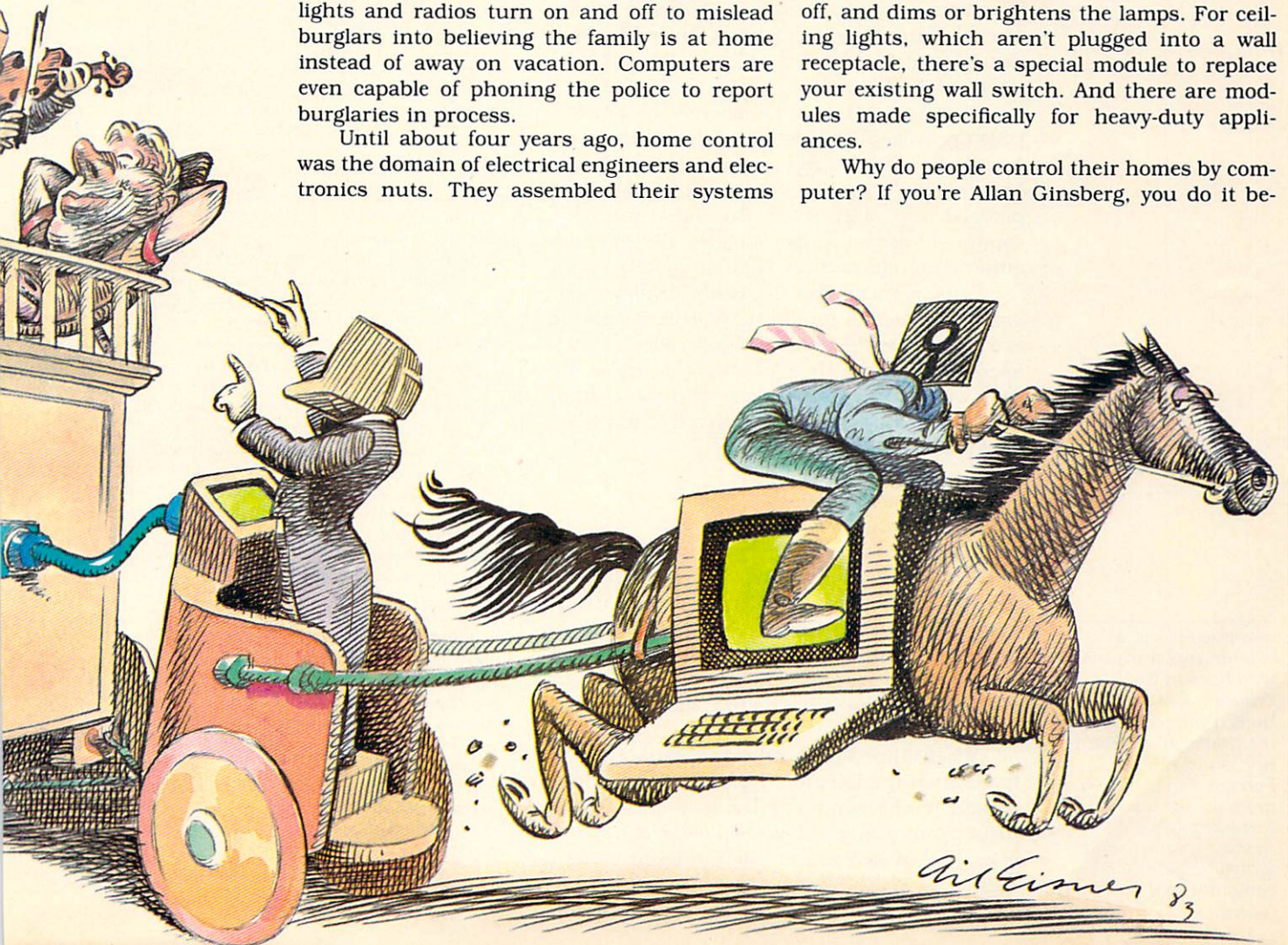
from components purchased at electronic specialty shops, or through advertisers in electronics magazines. Today, you can purchase plug-in components at Radio Shack, Sears, and local hardware and department stores, and hook them to almost any computer. It's not that expensive, unless you want a control system with lots of gimmicks (and a Tiffany price tag), and it's not that difficult. "If I can do it, anybody can," says Ginsberg. "I can barely program my computer. And I bought all the components at local shops."

ELEGANT SIMPLICITY

The least complicated of these control systems is elegantly simple: You develop the schedule for turning lights and appliances on and off, and record that data on cassette or disk. (Home control programs can be bought as commercial software, or written yourself. See sample on next page.) The commands from that program go from your computer, through an interface, and to a controller unit. The controller unit gives signals through your house wiring to "modules" that plug into your standard electric receptacles. You plug your lamps and appliances into these modules (see diagram).

The signal from the controller unit to a specific module turns the electric current on or off, and dims or brightens the lamps. For ceiling lights, which aren't plugged into a wall receptacle, there's a special module to replace your existing wall switch. And there are modules made specifically for heavy-duty appliances.

Why do people control their homes by computer? If you're Allan Ginsberg, you do it be-



**TO SIMULATE
MOONLIGHT IN
THE SALTWATER
AQUARIUM,
ULTRAVIOLET
BULBS WAX AND
WANE.**

cause you love to see how many functions you can put on automatic. He's programmed his computer to turn on the electrical gadgets that cook the bacon (a "Baconeer") and boil his 3-minute egg (an "Egger"), toast his bread, and brew his coffee. But breakfast is only a starter on Ginsberg's menu of home control.

FROM SUNRISE TO MOONSET

The lights, heat, air conditioner, and sprinkler are on the system. And his Jacuzzi is brought to 102° every night at the same time. He has installed light sensors and motor-controlled drapes so that the computer can determine when to open and close the curtains. For his 300-gallon, indoor saltwater aquarium, Ginsberg has programmed light changes that simulate the transitions from dawn to dusk and moonrise throughout the 24-hour cycle. To simulate moonlight, ultraviolet bulbs wax and wane. Door and window sensors signal the computer when touched; if that happens, the police are called, automatically.

2K IS ENOUGH

Ginsberg has three computers: an Apple IIe, an IBM PC, and a Centurian. It is this latter one, with only 2K of memory, that runs most of Ginsberg's system. He says it has more than enough memory to keep the system going and is a breeze to set in motion. "It just asks me when I want something to go on, and I say, 'Saturday at 11 a.m., etc.' There's no programming involved."

The cornerstone of Ginsberg's system is a BSR Controller. This is connected to the Centurian computer, designed specifically for home-management systems, and to modules plugged into receptacles. On signal from the computer, the controller triggers the modules either on or off, and the appliances follow suit.

Ginsberg also has the BSR Telephone Responder unit that makes it possible for him to call home and instruct the controller to turn specific appliance or light modules on or off. This way he can start the roast in the oven or turn on the air-conditioning ahead of schedule, if he's arriving home early.

ELECTRONIC NANNY

A somewhat less conventional home-control application was that tried by Karen and Edward Adler of Sands Point, New York. Their Apple computer was two years old when their first child was born in 1980. Although lawyer Adler had been fascinated with electronic gadgets as a teenager, and had dreamed of an automated house, he hadn't done anything about it.

When the Adlers brought baby Heather home from the hospital, however, they quickly turned to the computer for help. Heather, it turned out, was a restless, colicky baby, whose cries roused her parents half a dozen times a night. To keep her happy and minimize the sleepless nights, Ed rigged the baby's crib on

springs so that it rocked when she awoke and tossed about. Then he hooked a burglar alarm, which switched on when activated by noise or motion, into the computer's game port. The burglar alarm started a low-speed motor whose shaft resolved and gently tugged a cord that rocked the crib. According to a simple seven-line loop program that Adler wrote in BASIC, the computer turned off the motor after a few minutes, by which time the baby was asleep again.

This went on for two years, until Heather outgrew the colicky syndrome. Meanwhile, the

Crib-Rocker Program

The *Crib-Rocker* program that Edward Adler wrote to rock his restless daughter's crib is disarmingly simple. Here's how it works:

```
10 REM ORIG. CRIB-ROCKER PROGRAM
20 REM BY ED ADLER (AUG. 1978)
30 CRYING = -16287:MOVEMENT = -16286:ROCKER
  = 100:ROCKON = -16295:ROCKOFF = -16296
40 IF PEEK(CRYING) > 127 OR PEEK(MOVEMENT) >
  127 THEN GOSUB ROCKER
50 GOTO 40
100 POKE ROCKON,0:REM START ROCKER
110 FOR T = 1 TO 30000:NEXT T
120 IF PEEK(CRYING) > 127 THEN GOTO 110
130 POKE ROCKOFF,1:FOR T = 1 TO 10000:NEXT T
140 RETURN
```

1. Line 30 assigns names to numbers used later in the program. Adler did this to make the program's logic clearer, but it is not necessary. For example, when sound and motion sensors are plugged into the game control ports, the computer can determine their status by looking at the values in memory locations -16287 and -16286 (called CRYING and MOVEMENT). The memory locations are indicated in the *Applesoft II BASIC Programming Reference Manual*.

2. Line 40 reads, in effect: If the sound or motion sensors are activated, then go to the ROCKER subroutine beginning in line 100. When a sensor is activated, the value of the corresponding memory location becomes greater than 127, a figure also taken from the manual.

3. If the sensors are not activated, the computer proceeds to line 50, where it is told to GOTO line 30. Once again, it checks the sensors. This loop continues until sound or motion is detected.

4. Line 100 starts the crib rocking, by turning on one of the four game control outputs (also called "annunciators"). This triggers a relay, which starts a motor, whose shaft is connected to the crib. Again, the value to POKE (0) is indicated in the manual.

5. In Line 110, the FOR T=1 TO 30000 time delay keeps the motor on for about a minute.

6. Line 120 reads, in effect: If the crying continues, GOTO line 110 and keep the motor running for another minute.

7. Line 130 reads: If crying has ceased (meaning the computer fails the IF test) the annunciator is turned off (POKE, 1). This stops the motor. Then there is a slight pause (the FOR T=1 TO 10000 time delay) to let the crib stop rocking.

8. Then, obeying the RETURN statement in line 140, the computer goes back to the next statement following the GOSUB call, or line 50. There, it is told to GOTO line 30, and begin the sensor-checking loop again.

[Note: The program was written in Integer BASIC, which varies slightly from most other BASICs.]

LESTER BROOKS is a veteran freelance writer who lives in New Canaan, Connecticut. He is a former officer of the Chase Manhattan Bank and the U.S. Foreign Service. He has written nine books, including *Great American Autos*, and writes frequently on computer and business topics.

HOME CONTROL PRODUCTS

COMPLETE CONTROL SYSTEMS

Generally include controller, clock timer, and modules; often include voice recognition and voice synthesis. Can control lights, appliances, heating/cooling systems, security systems, and other electrically controlled devices. These systems generally connect to computers via the standard RS232 serial interface.

Homebrain

Salem Industrial Park
P.O. Box 137, Route 222 E.
White House, NJ 08888
(201) 534-9700
\$1,499

Waldo

Artra, Inc.
P.O. Box 653
Arlington, VA 22216
(703) 527-0455
\$599 (Apple IIs, plus \$199 for voice synthesizer kit); \$399 (Heath/Zenith assembly kit, plus \$199 for voice synthesizer kit)

TomorrowHouse System

Compu-Home Systems, Inc.
3333 E. Florida Ave.
Denver, CO 80210
(303) 777-6600
\$895 and up (Apple and compatibles)

COMMAND UNIT/CONTROLLERS

These units perform many of the same functions as the complete systems, but cannot control as many electrical outlets. Command units don't usually have built-in voice synthesis, built-in clock timers, or modules. They most often connect with the BSR X-10 system and modules. Check before buying to make sure that the unit will connect to your computer; most require a standard serial interface (RS232) or the IEEE serial interface.

CmC BUSSter C64

Connecticut MicroComputer, Inc.
36 Del Mar Dr.
Brookfield, CT 06804
(203) 775-4595
\$495 (Commodore 64; RS232 serial interface; IEEE 488 serial interface)

CSI System 1200

MicroProcessor Associates, Inc.
P.O. Box 3438
Nashua, NH 03061
(603) 888-9900
\$170 (RS232 serial interface)

SciTronics RC-100A

523 S. Clewell St.
Bethlehem, PA 18015
(215) 868-7220
\$259 (S-100 bus; IEEE 696 serial interface)

Device Master

Tecmar
6225 Cochran Rd.
Solon, OH 44139
(216) 349-0600
\$245 (IBM PC)

CLOCK TIMERS

These units function as calendar, clock, and timer, so that you can set a control schedule for several weeks at a time. The schedule can vary from day to day.

SciTronics RTC-100

(Address above)
\$199 (S-100 bus; IEEE 696 serial interface)

The Clock #01-229

Mountain Computer, Inc.
300 El Pueblo Rd.
Scotts Valley, CA 95066
(408) 438-6650
\$280 (Apple II plus, IIe)

MODULES

These plug into electric receptacles and receive signals from the computer via the controller. Items such as lamps and appliances that are plugged into the modules are turned on or off according to the signals.

BSR X-10 System

BSR (USA) Ltd.
Route 303
Blauvelt, NY 10913
(914) 358-6060
Command unit (\$49)
Lamp Module (\$22)
Appliance Module (\$16)
Wall Switch Module (\$16)
Thermostat Controller (\$60-\$80)
Also sold under Sears and Plug 'n Power brand names.

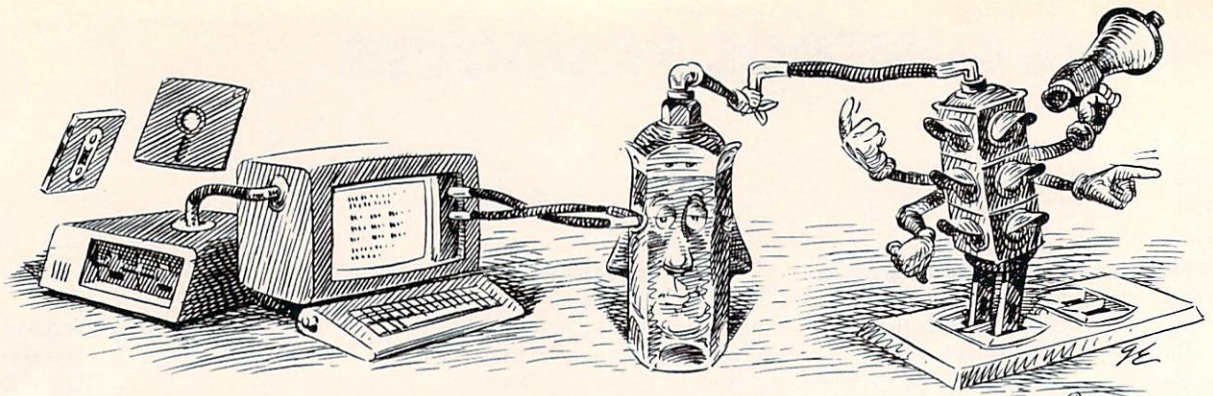
PROGRAMS

These can be in cassette or disk format, or built into the controller. The programs, generally sold in conjunction with the controller, contain the control schedule and send signals to modules at the proper time.

SENSORS

These devices detect heat or light changes, and noise and motion. If the controller is programmed to turn off the boiler when it reaches a certain temperature, the signal to do so originates with the sensor. Or, if an alarm is to sound when a door is touched, the signal will come from the sensor. Sensors can be found at electronics stores and Radio Shack stores.

**HOME CONTROL
PRODUCTS CAN
BE BOUGHT AT
SEARS, RADIO
SHACK, AND
HARDWARE
STORES.**



Adlers carefully tracked Heather's diet and correlated it with the computer log of her restlessness. They hoped to determine which foods might be affecting her. They experimented with changing nap and meal times and food until they found the combinations that resulted in the most peaceful nights. "The computer saved us a lot of sleepless nights," says Ed. The whole system, besides the computer, cost him about \$20 for parts.

ENERGY ASSESSMENT

Now that the rock-a-bye crib is no longer needed, Ed is monitoring energy use of his heating and air-conditioning systems. Electric thermostats, hooked into one of the Apple's game ports, run outside the house, to the attic and basement. A sensor hooked to the oil burner or air conditioner runs to the other game port. The computer keeps an up-to-the minute log of all temperature changes and corresponding oil burner use, allowing for direct comparison. Ed can get a daily, weekly, monthly, or yearly printout of this data in figures or in the form of a bar chart.

And he also discovered that when he turned his electric water heater off at night, in the hope of conserving energy, it took as much electricity to restore it to usable temperature as it did to keep the heat on all night.

A TIGHT PROGRAM

Adler's current home-control program, which he wrote mostly in BASIC but with some routines in machine language, is a far cry from the seven-line loop program that put Heather to sleep. It is so long, and stores so much daily information, that all of the computer's 48K RAM memory is used up. If he wants to use the computer for other tasks, he must momentarily dismantle the home-control system.

But it need not always work that way. David Staehlin, a highway construction engineer in Albuquerque, New Mexico, programmed his 48K Heath H8 computer to control lights, heating and cooling systems, and lawn sprinklers. "The entire control system took up only 8K. I had it running in background mode 24 hours a day, and still had capacity for other tasks."

Still another way of computerizing a home is the package approach. Instead of assembling his system component by component, Robert

Willson of Cincinnati has installed a complete "TomorrowHouse" system in his home. The TomorrowHouse, which costs \$895 and up depending on what capabilities you want, and works with Apple computers, was designed as an energy conservation system. It turns lights on and off, and monitors temperatures minute-by-minute, alternately turning the heat up or down. It also calls the police when an intruder triggers the security system. And it can do more yet.

"GOOD MORNING, JONATHAN"

Jonathan, as Willson calls his TomorrowHouse system, wakes him each day with a mechanical-sounding "Good morning, Master." Then Jonathan reports the time, temperatures indoors and outdoors, and Willson's appointments for the day. Jonathan's synthetic-voice capability is probably the most unusual part of his repertoire, but fortunately you can shut him up if you want with a simple command to the computer.

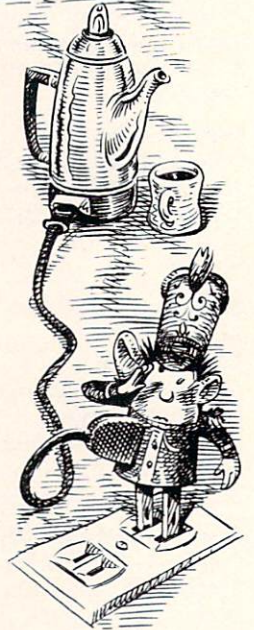
The TomorrowHouse system is easy to install, according to Willson. "You can do it if you can snip wires and use a screwdriver. And you really don't do any programming. You just answer a series of questions TomorrowHouse asks you. You basically give the computer a profile of what you want the house to be like. You can schedule up to nine weeks at a time—every day different or every day the same," says Willson.

LIFE IMITATES ART

Jonathan's announcements are backed up by memos on the computer monitor. They give date and time, and a floor plan of the house showing which lights or appliances are on and whether the garage door is open or closed. And even the temperature of the hot tub.

Well, you get the idea. It seems that people who like home control by computer like hot tubs. So maybe it's a bit of a gimmick or fad that's not for everyone. But, remember the 1970s movie, *The Demon Seed*, about a computer that controls a scientist's house? That was science fiction, and the science fiction has become a reality. Which means that practical benefits, a little difficult to pinpoint now, may soon follow. Right, Jonathan?

"Yes, Master." ■



A home control system works like this:

1. A program tells the computer when lights or appliances are to be turned on or off.
2. The computer is connected, through an interface, to a controller unit.
3. The controller is plugged into an outlet, and its instructions are carried through the house wiring to all other outlets.
4. A module, plugged into one of these outlets, receives its instructions.
5. A coffee pot, or any other electrical device plugged into the module, is turned on or off.

How to Make Your Own Computer Cover for Just a Few Dollars

WITH A SMALL INVESTMENT OF TIME AND MONEY YOU CAN PROTECT A VALUABLE ASSET—YOUR COMPUTER.

BY ELAINE BALKMAN LATIMER, WITH JOEY LATIMER

One afternoon, as the sun angled its light through our windows and across our computer table, the computers faded from my vision and I saw only dust. Tons of dust! And although I'm a far cry from the stereotyped mad-rag housewife, I became alarmed. The realization that there was that much dust and dirt around, even after a thorough cleaning, made me think seriously about getting covers for our computers.

After checking into the price of mail-order covers, though, I was inspired to create my own. I had to laugh at first because I can hardly sew. Since that first chuckle, however, I've turned pieces of fabric into smooth folds. You can too! Here's how:

SUPPLIES

| | |
|---------------------------------|-----------------|
| One yard of fabric per computer | Matching thread |
| Sewing machine | Scissors |
| Seam puller | Pinking shears |
| Yardstick | Tape measure |
| Straight pins | Chalk |
| Iron | Ironing board |
| Pencil | Paper |
| OPTIONAL ITEMS: | |
| Waterproofing | Seam binding |
| Iron-on letters | |

1. STEP GATHERING MATERIALS



After figuring out what I'd need and making a list, I rummaged around the house and came up with everything except the fabric. On the bargain tables at my local fabric store I found several poly-cotton fabrics like those used in pictures of computer covers shown in magazines. After a few minutes of looking, feeling, and smelling, however, I decided on two yards of finely ribbed corduroy. (The two yards were enough to cover the Commodore 64, our new Atari 800, and my mistakes.) The total, including matching thread, came to \$4.71! This would barely cover the cost of shipping mail-order covers.

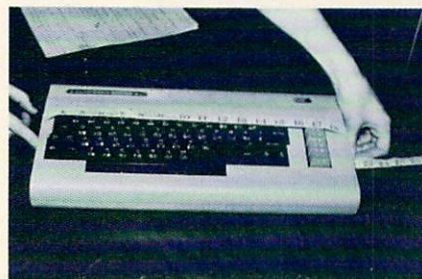
2. STEP PREPARING THE FABRIC

"Before you do anything," my high school sewing teacher would insist, "always wash, dry, and iron cotton fabrics. This keeps your final product from shrinking when you wash it." She was right. Washing and ironing the fabric makes it much easier to work with.

When your fabric is ready, spread it out on a flat surface with the wrong side of the material facing up. Now you're all set for measuring and drawing the pattern onto the fabric.

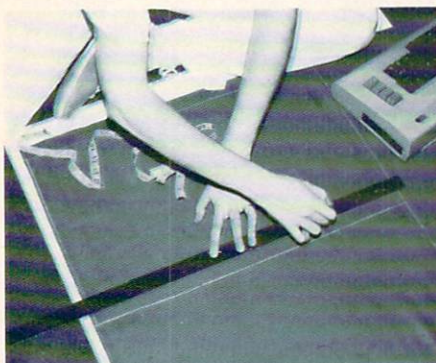
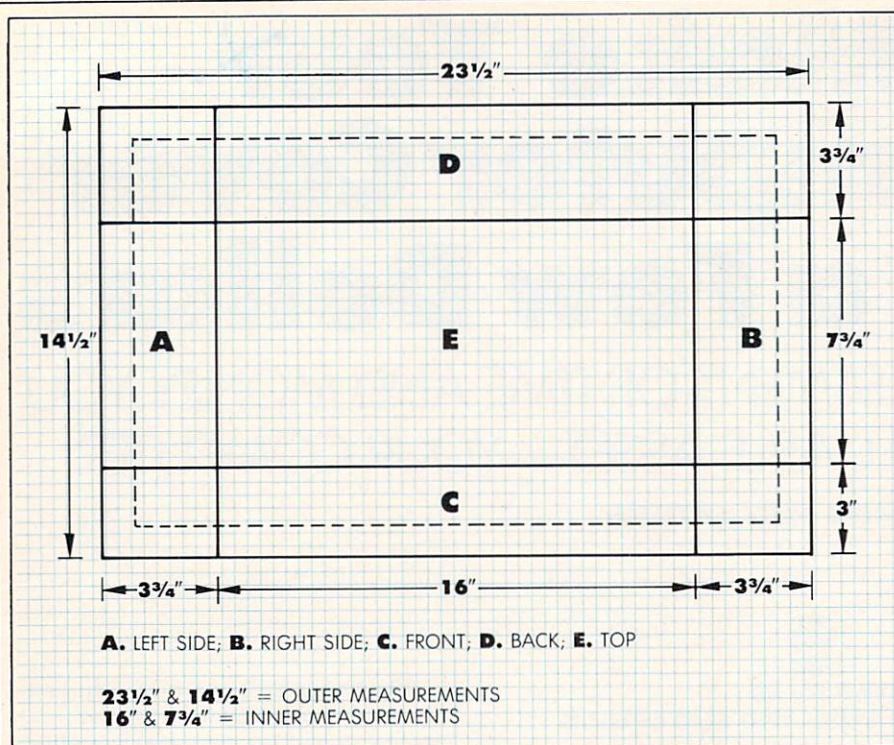
3. STEP MEASURING AND PATTERN-MAKING

Measure the computer from bottom front to bottom back and from bottom left side to bottom right side.



Add two inches to each measurement for a hem allowance, then jot the numbers down on a piece of paper. These are your outer measurements. Using a yardstick, measure and draw—with chalk—a rectangle on the fabric using the outer measurements as the sides (see diagram on next page).

ELAINE LATIMER is becoming a frequent contributor to FAMILY COMPUTING. Her last article, "How to Be the First Computer on Your Block," appeared in the October issue.



Now, measure the top dimensions of your computer from front to back and from left to right. These are your inner measurements.

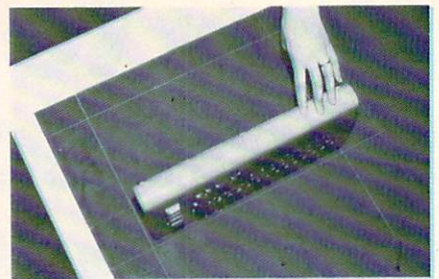


Measure the back of the computer, from the bottom to top. Add a one-inch hem allowance (pictured as a broken line in the diagram), and you have the vertical measurements for the back of the computer ("D" in diagram).



Measure the front of the computer, add a one-inch hem allowance, and you have the vertical measurement for area "C," the front of the computer.

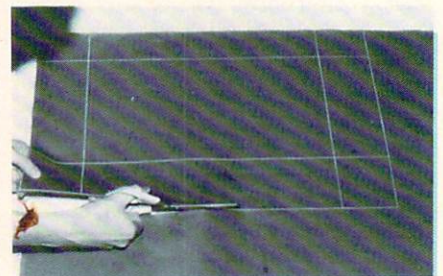
To determine the horizontal (left and right) measurements for areas "A" and "B" you must measure the side of the computer, from bottom to top, at it's highest point, and add a one-inch seam allowance.



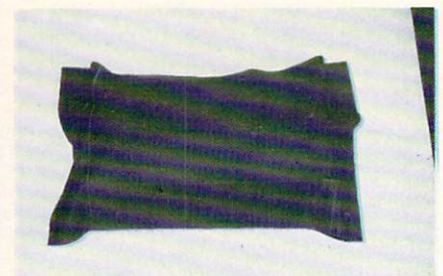
Draw your inner lines onto the fabric. Be sure to extend them through the outer lines. Doing this will form the corner sewing lines (see diagram).

4. STEP CUTTING AND FITTING

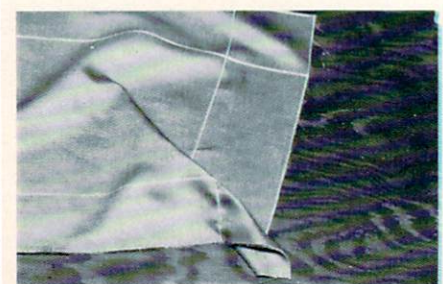
Cut the pattern out along the outside lines.



Next, lay the cut piece over your computer and determine where the top corners of the computer are.



They should be right under the point at which your inner lines meet. Notice the two lines that run downward at each corner? Pin those lines together. Make sure the pins are right on the line. When all corners are pinned, you're ready to sew.

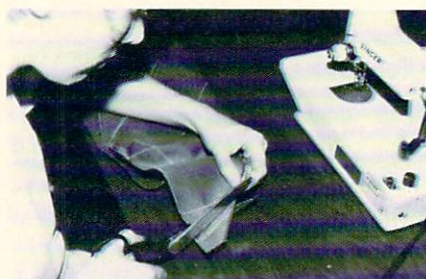


STEP 5. SEWING

Sew the corners along the lines you've pinned, removing the pins as you go.



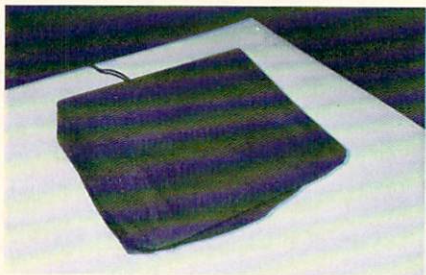
Clip away the extra fabric, leaving half an inch from the seam.



Press the seam open and stitch along the edge of the opened fabric to prevent fraying.



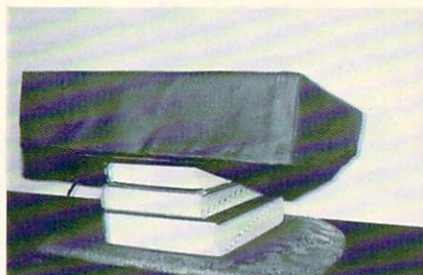
Now, turn the cover right side out and place it over your computer.



Measure and pin up the hem.



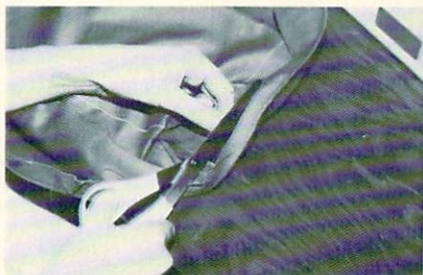
I found it easy to see whether or not my hem was even and to check the length by setting the computer on top of a stack of books.



When the hem looks right, sew it.



My hem measured about a quarter of an inch. If you line the fabric up with the outside of your sewing machine foot and keep your eyes on the seam as you're sewing, your hem line will be straight. Once the sewing is completed, cut off the excess.



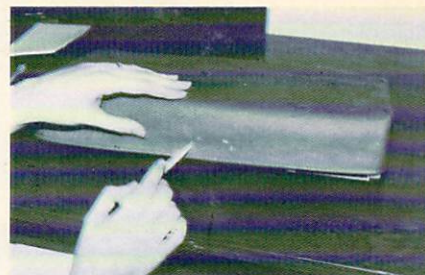
Seam binding is optional.

STEP 6. OPENINGS FOR CORDS

Measure the circumference of the cord.



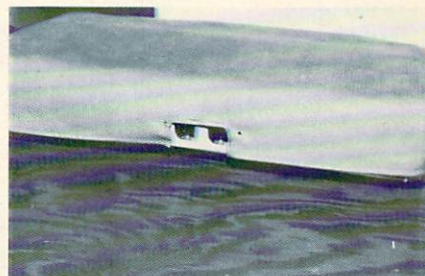
Mark this on the material as the opening needed for the computer's cord(s).



Draw a second outline a quarter to a half inch inside the first to create a fold-under seam. Cut out this second hole, and cut quarter-inch diagonal slits at the corners.



Then fold the seams under and pin.



Sew close to the edge, clip away the excess fabric, and, using a hot iron, press the entire cover. Be sure to remove all threads hanging down from the underside.

OPTIONS

Waterproof your cover with one of the available spray products on the market. Sew or iron on initials, names, or numbers. If you're very creative, you could do your own needlepoint or embroidery. **FC**



Things Computer Salespeople Seldom Tell You

WHEN SHOPPING FOR A COMPUTER,
WHAT YOU DON'T KNOW CAN HURT YOU.

BY ROGER SCHULMAN

The salesperson in the computer store smiled and held up a briefcase-size machine with a keyboard on it. "This is the computer for you," he said.

That sounded like good news to me. I opened my mouth to speak but he wasn't finished yet. "It does everything. It has built-in word processing, built-in BASIC, and a built-in appointments program. And, it's got a built-in disk drive." He laid the computer gingerly on his desk and folded his hands together. "Should I write up an order?"

I blinked. "How much is it?"

"With 48K RAM option, about \$1,500."

"No, don't write up an order. I think I'd like to take some time, try it out—think it over."

The salesperson pressed his lips together. "But why?" he asked. "It does everything you want."

I laughed. "How do you know? You never asked me what I want."

WHAT'S LEFT UNSAID IS OFTEN MOST IMPORTANT

When I walked into the computer store that day, I was interested in learning about the new portable I'd heard about. As I left, I realized I hadn't found out much about the new machine, but I did get a lesson on computer salespeople. The salesperson I had just gladly walked away from certainly wasn't doing me any good, and I couldn't see how he was doing his store any good either.

What he was saying bothered me—but what bothered me even more was what he wasn't telling me. A computer salesperson is often your primary source for information about computers. And when it comes to shopping for computers, what you don't know can hurt you.

Salespeople—computer, automobile, or otherwise—have one thing uppermost in their minds as they approach you, flash a smile, and extend a hand: Can I sell this person something? There's nothing wrong with that atti-

WHEN SALESPEOPLE SAY:

"You can use this computer with a TV or monitor."

YOU SHOULD ASK:

"What monitors are compatible with the computer, what kind of cables do I need to connect them, and how much do they cost?"

WHEN SALESPEOPLE SAY:

"This dot-matrix printer is designed to work with your computer."

YOU SHOULD ASK:

"Do I need a special interface or special cables to connect it to my computer? How much do they cost? And can it print out the special graphics characters my computer produces?"

ROGER SCHULMAN is the coauthor of *Seven Simple Steps to Buying a Personal Computer*, and *Seven Simple Steps to Buying a Personal Computer for Your Child*, to be published by Warner Books in the spring of 1984. He currently writes for *Newsweek* magazine.

tude—after all, you're there to buy something. But, unlike other salespeople, computer salespeople work in one of the most rapidly changing fields, and that gives them an added responsibility: They must be educators as well as sellers.

As a computer shopper, it's important to keep your ears tuned to catch what salespeople leave out as they tell you about a particular computer, program, or accessory. First, let's take a look at what computer salespeople can't tell you without your help. Then, we'll see what salespeople seldom tell you unless you ask them directly.

YOU TAKE THE LEAD

Good salespeople want to sell something you need rather than what they're pushing. Their first job should be to find out about those needs so they can translate them into the right computer system for you. To do that, they need your help. Take some time to think about what you want and need from a computer system. You needn't become an expert on computers, but you shouldn't walk up to a salesperson knowing nothing.

Read a few magazines. Thumb through a book or two. Consider the different jobs a computer can do: play games, word process, enhance education, help with the budget, etc. Once you have an idea of what you want a computer system to do for you, you can stride up to a computer salesperson with confidence and say, "I'm interested in buying a computer system to do A, B, and C. Can you help me learn a little more about what I should buy?" Unless you have that question ready to roll off your tongue, a lot of salespeople won't give you a chance to ask it.

Here are a few more important questions to ask. Often salespeople will steer you away from these questions, or pass them off with an unsatisfactory answer. Keep probing until you get the information you need to make a decision.

QUESTIONS TO ASK

What do I need for a working system, and how much will it cost me? You need more than just the keyboard unit, or Central Processing Unit, to make a complete system. Salespeople often fail to tell you that you need cables to hook up a monitor or printer; that you need a special interface to connect the printer; that you need software to do almost any of the wonderful things they talk about; and that you need a tape recorder or disk drive to store any information. All of this, of course, costs money—a lot more money than the salesperson originally said you'd have to part with.

Is everything I want fully compatible? You should double-check with your salesperson to make sure that every piece of hardware you want to buy—the computer, the tape recorder or disk drive, the printer, the modem—can connect and work together. If they

WHEN SALESPeOPLE SAY:
"If you want more memory, you can expand the RAM to 64K."

YOU SHOULD ASK:
"What do I have to buy to do this? Can I do it myself, or do I have to send the computer back to the company?"

WHEN SALESPeOPLE SAY:
"This is a great computer for word processing."

YOU SHOULD ASK:
"Is the keyboard comfortable for extended use, and how many characters per line does the screen display?"

WHEN SALESPeOPLE SAY:
"Just take this modem home and hook it up to your phone, and you've got the world at your fingertips."

YOU SHOULD ASK:
"Is the modem designed to work with my computer? And don't I need software to make the modem work?"

IF YOU'RE BUYING A COMPUTER, HERE'S WHAT YOU SHOULD LOOK AT

**IN GENERAL, THE
MORE KEYS A
COMPUTER HAS,
THE QUICKER
AND EASIER IT
WILL BE TO USE.**

Figuring out what kind of computer best suits your needs means wading through a torrent of terminology and numbers. You hear it from salespeople, you read it in ads. But not all the manufacturer's specifications need concern you. For example, if you're interested in games, then a computer's sound and graphics capabilities are more important than its text display. If you want to use the computer for word processing, then the type of keyboard and text display are of primary importance.

Following are brief descriptions of the categories manufacturers and dealers refer to in their sales presentations.

Memory. The amount of RAM memory a computer has will affect the kind of software it can run. Word-processing, electronic-spreadsheet, and other business-applications software generally require a minimum of 48K RAM to be used effectively. To run game or educational software, or write programs, you need considerably less memory.

Typically, some of a microcomputer's memory will be preempted by certain built-in programs, such as a BASIC interpreter and an operating system. Thus, even if a computer is advertised as having 64K of memory, not all of this memory will be available to the user.

The computer's built-in (ROM) memory is not accessible to the user. Generally, a computer with a larger ROM will have more built-in features, or a more extensive BASIC, with less user-available memory.

Keyboard. The kind of keyboard a computer has will dictate its efficiency for certain tasks. The more keys a computer has, the easier and quicker it will be to use. A typewriter-style keyboard is important for word processing and writing large programs, but less necessary if a computer is to be used primarily for entertainment. For business or home-management applications, a separate numeric keypad, which acts like a calculator, is a big plus. Special function keys, which are used to carry out frequently used instructions, and independent cursor keys will make any keyboard quicker and easier to use.

Video output. Most home computers do not come with a video screen and must be connected to a TV set or monitor acquired separately. A TV provides sufficient image resolution for most casual home use;

for more intensive use, particularly where 80 columns of text will be displayed, a monitor is preferable because it provides a sharper, clearer image. Monitors often require special cables for hookup. See "Buyer's Guide to Monitors," in the October issue.

Text display. Many computers offer a 40-column text display, about the maximum number of characters a TV can resolve legibly. Some computers may feature, or offer as an expansion option, the ability to display 80 columns of text. This is standard for word-processing or spreadsheet use. The availability of both upper- and lower-case letters is also important for word processing. Computers featuring special graphics characters or multicolored text modes are desirable for educational or entertainment use.

Graphics. High-resolution color graphics are standard on some microcomputers. Important factors for comparison are the number of colors available and the range of graphics resolution. This is measured in terms of "pixels" (picture elements), vertically and horizontally. The more pixels, the sharper the screen image.

"Sprite" graphics, or "player missile" graphics, featured on some computers, allow the user to define a variety of graphics objects and manipulate them on the screen.

Sound. Microcomputers generally offer from one to four voices, or channels, of musical sound, and cover varying octave ranges. The quality of sound is most important for game playing, or for those who wish to experiment with musical composition. Beyond this, some computers offer speech synthesizers, which can pronounce words.

Languages. The BASIC language is built in (or available in plug-in cartridge form) in most microcomputers. Dialects of BASIC differ, particularly in the area of graphics commands. If your interests lie in programming, search for a computer that supports Extended BASIC.

To be programmed in other languages, most computers require an additional circuit board or specialized software. If young children are to use the computer, languages to look for are PILOT and LOGO, which are becoming increasingly important in education. PASCAL, FORTH, FORTRAN, LISP, COBOL, and other optional languages may be important for the user who wishes to experiment with programming.

don't connect easily, you may have to have special cables or interfaces made at electronics shops. Try to avoid this nuisance like the plague. It's worth taking the time to actually connect everything in the store, if possible, and see if it runs well.

If you're buying at a large department or discount store, this won't always be possible. This is one of the sacrifices you make when buying discount.


Is there any good software for the computer I want? Don't let salespeople talk about software in a general way. This often means they don't have much to say. Ask them to demonstrate a few programs of the type you're looking for. If they can't produce the software, don't accept promises that "it's coming soon." Some people who made this mistake have ended up with a computer that served as an expensive piece of sculpture for months before the software finally arrived.

Can this system expand with my needs? Even when buying your first computer, you should look to the future. If you fall in love with computing, you'll eventually want to expand your system with peripheral devices—maybe even a speech or music synthesizer. Or you may want to expand the computer's RAM memory, the number of characters you can display on the screen, or the number of colors your computer can produce. The right time to find out how far a computer can expand—and how much that expansion will cost—is *before* you buy.

What about service and support? Support refers to what a store or manufacturer will do to help you learn how to use your system correctly; service refers to what they will do if something you buy is defective or breaks down. Make no mistake: Many stores include the cost of service and support in the price tag, so you might as well get what you're paying for.

Hardware and software are serviced separately, so ask these questions about both. What's the manufacturer's warranty? Does the store offer its own warranty? Is there in-store repair service? Does the manufacturer offer a toll-free number you can call if you need help? Can you return defective products? Does the software include a backup copy? If not, will you be able to make a backup copy at home or get a backup from the manufacturer?

WHAT ALWAYS GOES UNSAID: "YOU'RE THE BOSS!"

You shouldn't expect salespeople to answer all of your questions instantly. It's far easier for appliance salespeople to know all about dishwashers than it is for computer salespeople to know everything about their stock in trade. But if the salespeople you meet don't answer your questions and compound that fault by being rude or abrupt, you've got a right to complain. Remember the most essential fact that most computer salespeople don't tell you: As the customer, you're the boss! 

WHEN SALESPeOPLE SAY:

"You can't go wrong—this computer does everything and only costs \$99."

YOU SHOULD ASK:

"How much will it cost to put together a working system—with a tape recorder (or disk drive), TV (or monitor), printer, and all the cables?"

WHEN SALESPeOPLE SAY:

"Buy it here, you pay \$299. Buy it at JoJo's Computers, you pay \$399."

YOU SHOULD ASK:

"Do you give a week of training sessions like JoJo's does? And do you get a one-year warranty?"

WHEN SALESPeOPLE SAY:

"If you want to go beyond BASIC, you can also use the LOGO and PASCAL languages on this computer."

YOU SHOULD ASK:

"What format do these languages come in? Does it mean I'll have to buy a disk drive?"

What's a Computer?

Since kids and computers make such a natural match, we turned to them with this difficult question. Here are answers given to FAMILY COMPUTING contributing editor Joey Latimer by some California kids.

A COMPUTER IS
A FISH AND THE KEYS
ARE A BABY OCTOPUS

THOMAS LAGUNA



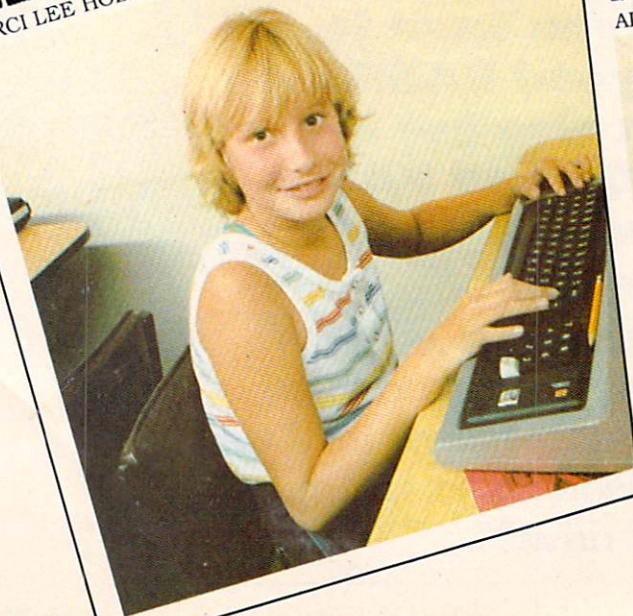
A COMPUTER IS
SOMETHING YOU
MESS UP ON

RUTH KAUFMAN



A COMPUTER IS
FASTASTICLY
THE WORST!

MARCI LEE HOLLINGSHEAD



A COMPUTER IS AN
ELECTRONICAL THING
THAT BUSINESSMEN
USE AND KIDS TOO

ADRIAN R. GUERRA



A COMPUTER IS
A DOG WITH 16K

VAL MARQUEZ



A COMPUTER IS A THING
THAT JUST DOES WHAT
YOU TELL IT TO DO

JENNIFER ANNE LEX



PROGRAMMING A COMPUTER
IS LIKE TEACHING
A CAT NEW TRICKS

LYLA MARQUEY



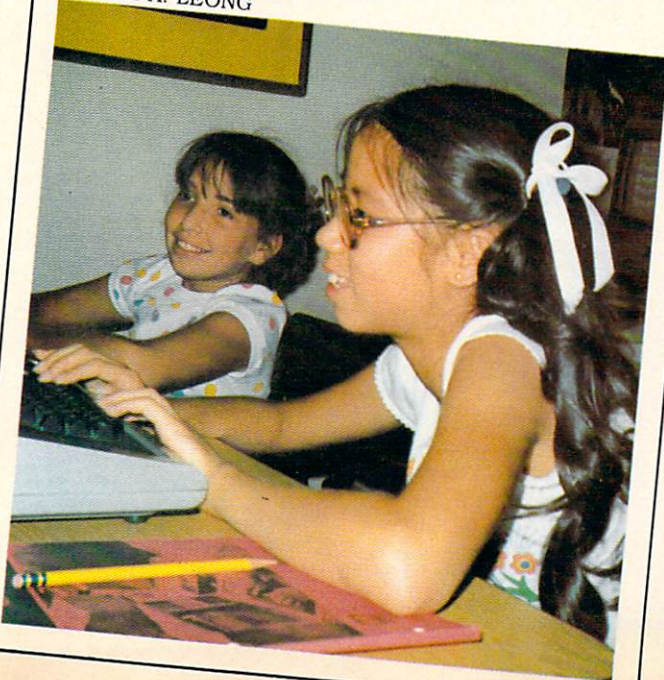
A COMPUTER IS A
SQUARE HEADED MACHINE

CHRISTOPHER DYE



A COMPUTER IS
SOMETHING THAT COPIES
WHAT YOU SAY

DENISE A. LEONG



A COMPUTER IS
A TYPEWRITER, A T.V.,
AND A BRAIN,
MIXED INTO ONE THING

DARREN CHAN



Games for Two... or Ten

PLAYING COMPUTER GAMES SHOULDN'T BE A LONELY EXPERIENCE. YOU CAN INCLUDE YOUR ENTIRE FAMILY OR HOST A PARTY WITH ONE OF THESE SELECTIONS.

BY PHIL WISWELL



ILLUSTRATION BY BARRY ROOT

Unfortunately, when it comes to computer games, most people's imaginations tend to stray into the arcade. There, rows upon rows of blinking, beeping, whirring boxes hold the solitary player transfixed, alone with a pocketful of quarters.

Placed in the warm setting of a family or living room, however, computer games are uniquely different from their arcade step-sisters. They can become much more "social" machines. Whereas arcade action is generally limited to one or two players engaged in shoot-'em-ups or mazes—pursuits that do build reflexes, timing, and hand-eye coordination—home computer games and the environment of the living room are genuinely conducive to family interaction. And the nature of human competition is more keenly felt when a game includes two or more minds simultaneously.

Many multiplayer games are so fascinating to watch and play that they interest and involve an entire group of players with a special kind of entertainment. These games tend to be richer and less predictable than the single-player type. Human opponents, after all, make mistakes, use trickery, experiment with weird strategies, and always learn something about their opponent. And learning something about your friends and family is what play is all about.

Almost everyone in the family should be able to enjoy these games, since all it takes is the skill to operate a keyboard or a joystick to share in the fun. The following recommendations are designed to encourage everyone to play and to play together through the computer.

SPORTS

Soccer by Thorn EMI, available for Atari 400/800/1200 (cartridge), \$44.95; joysticks required.

Owners of Atari computers often brag about having four joystick ports, but not many sports games have made use of this feature. Soccer is a four-player game that by itself nearly justifies the purchase of extra joysticks. The playfield consists of three screens that scroll back and forth depending on the position of the ball. True to the real sport, each team has 11 players on the field. A player can intercept passes, trip opponents, dribble the ball, pass it to a teammate, or make a goal shot. Now for the neat part: Up to four people can each use a joystick and play on the same team against the computer, and at any point in the game, a quick press of your joystick button allows you to control the player nearest the ball.

What all this spells is T*E*A*M*W*O*R*K, and it really feels great! With three or four against the computer, or with two against two, you get a lot of shouting, a lot of laughing, and



a lot of role-playing, but more important, you get the deepest sports game of team strategy on the market. Soccer is a wonderful family computer game, and it's recommended for all age groups.

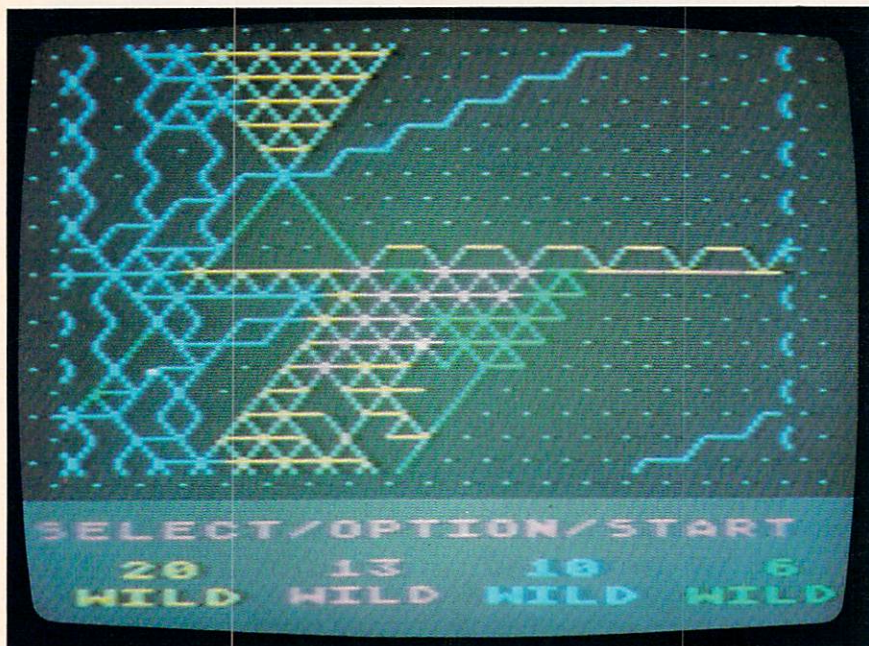
Decathlon by Microsoft, available for Apple II/II plus (disk), \$24.95; controllers required.

In the four years since Decathlon was first published, nothing has come along to replace it. Although players must alternate turns, it's still one of the best games to pull out in a social situation because of the variety of its 10 events and its ability to accommodate up to six players. (The computer even calls you—by name—to the starting line for each event.) An awards ceremony is included at the end.

Decathlon is easily understood because it simulates events you're familiar with: the 100-meter dash, long jump, shot put, high jump, 110-meter hurdles, discus throw, pole vault, javelin throw, and, finally, an exhausting 1,500-meter run. Running is pretty straightforward—a matter of tapping two keys as rapidly as possible—but a combination of different keys is used for a complicated event such as the pole vault. Two fingers get up your running momentum, a press of another key plants your pole (in the box, one hopes), then a second keypress causes your athlete to do a handstand on the pole, and a final tap makes your competitor let go. Fair warning: Don't be surprised if you don't clear the bars in the pole vault or high jump the first day you play this game. Decathlon is a game of timing rather than of wrist jerking, and strategic planning plays a very important role. For this reason and for the sake of newcomers, the computer will ask whether you wish to start the decathlon or run practice heats for specific events to warm up, so to speak.

Teamwork is the key to Soccer, an action-packed challenge for one-to-four players.

PHIL WISWELL, a video- and computer-games critic, is the author of a series of one-hour video cassettes, called How to Beat Home Video Games. His at-home office is often crowded with neighbors and friends (including those of his two-year-old son) who come to play one or more of the 700 games that line his shelves.



Worms? players must train their slimy serpents to move while competing to track the largest percentage of the screen.

Championship Baseball by Milton Bradley, available for TI-99/4A (cartridge) \$59.95, with voice recognition; \$49.95, without voice recognition. The MBX Expansion System (\$129) is required for voice recognition; joysticks required.

Sports games on computers have always been complicated by the need to access so many different team members, and games that use fewer players than regulations call for don't offer the rich strategic detail that is possible. Often, by the time you punch the proper button and begin to chase the ball, the batter has rounded first base! *Championship Baseball* and the MBX unit do away with that through a technological innovation: voice recognition.

Before the first pitch is thrown, both players program the computer to recognize nine words that will identify their defensive team members. Thus, when the ball is hit to third base, you will have control of that position the moment you say "third" or "Brooks" or "Nettles" or whatever word you've chosen to represent your third baseman. A command such as "first" will cause "Brooks" to throw the ball to first base, and the computer will attempt to execute double plays upon the multiple command "second, first."

The defensive player uses both a headset/microphone and a 64-key input pad, which chooses speed and type of pitch, introducing finer strategy than previous video versions of our great American pastime. Batting and running are done with the traditional joystick method. And the game not only understands English—it speaks English, as an umpire calls the balls, strikes, and outs.

STRATEGY

Ricochet by Epyx, available for Apple II/IIe,

Atari 400/800, VIC-20 (disk and cassette), \$29.95.

Ricochet is everything a two-player computer strategy game should be: It makes use of the computer's ability to simulate games that cannot be played in the physical world.

Each player controls six moveable pieces, shaped like narrow rectangles, initially arranged "bowling-pin fashion" in front of the goals you must protect at opposite sides of the screen. Each player also controls two cannons, one in each corner, aimed at 45-degree angles. The dots on the playfield are there only to help you visualize the path a ball will take from either cannon. When a ball hits the top or bottom wall or a playing piece, it turns 90 degrees and continues until one of two things happens: it exits the field between the goal and the cannon, or hits a cannon, rendering it unable to shoot for several turns.

The pieces are used to block opponents' potential shots at your goals and cannons. But here's the catch—when a piece is hit, it turns from north-south to east-west (or vice versa), which makes the game increasingly complicated as some shots bounce around 50 or 60 times before coming to rest. This is displayed visually and audibly in an exciting, almost arcade fashion as the ball caroms off everything in sight.

Worms? by Electronic Arts, available for Atari 800/1200, Commodore 64 (disk), \$35.

Worms?, a game of impressive, unique graphics, is one you'll have fun with, but it didn't necessarily start out that way. The game is based on a magazine article about a group of scientists at Cambridge and MIT who were working on patterns that could be created by artificial, mathematical, logically trained worms. *Worms?* takes off from there.

As with *Ricochet*, the playing board is a field of dots, and each player simultaneously has a worm on screen that must be trained in order to move. Initially the worm, consisting of one small line connecting two dots, is "dumb." That is, on the "go" command, it shoots straight to the next dot, but stops and waits for your command: LEFT, RIGHT, DOWN, UP, or some combination. The worm then knows what direction to head in. Players take turns giving their worms instructions, but after a while the worms begin to move on their own. When one worm reaches an impasse, it must be trained how to tackle it before the other worms can continue moving.

The object is to capture the most territory on the board. There are six directions for each dot, and the player to lay the last line to a dot wins that territory, which changes to the color of his or her line.

This game is rather abstract (you really can't expect yourself to understand idealized

mathematical worms), but you can sure have fun and create the most beautiful three-dimensional line drawings you've ever had a hand in. And since most people end up playing by intuition, children and adults often compete at the same level.

Concentration by HesWare, VIC-20 (cassette), \$15.95. (Note: Although this game was recently discontinued, inventory remains high in many stores. Contact your dealer for availability information.)

This two-player challenge is recommended for its appeal to young children. Most people, even youngsters, seem to know the rules upon sight of the screen: There are 48 boxes on the match board, and behind each box is a symbol. The idea is to find matching symbols by alternating turns. During each turn a player may turn over only two boxes.

It's a game of memory, and though the first matchboard is always the same, succeeding boards vary the symbol locations, making it very difficult to remember them.

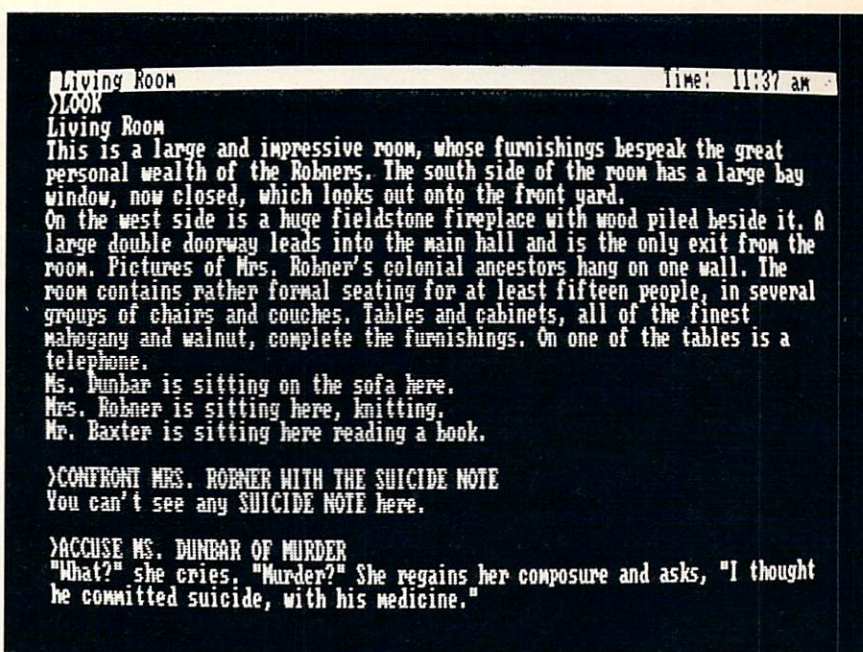
Manipulating the game is a breeze, done with a single joystick shared by the players. Just move to the box you want and press the button to reveal the symbol. You can't do anything wrong or get confused. Although *Concentration* can be played solo, it's not recommended. The game just doesn't make it without human competition.

M.U.L.E. by Electronic Arts, available for Atari 400/800/1200XL, 48K, Commodore 64, \$40 (disk); joystick required.

This one-to-four-player graphic adventure game about carving a living from raw land materials is a very social experience, attracting spectators like few other games. If the game isn't immediately exciting, the music will entice players from all corners of the house. The title stands for Multi Use Labor Element, a kind of mechanical mule that each player must use throughout the game. Not unlike the real animal, a M.U.L.E. takes on the personality of a stubborn character and your job is to get it to work for you in the most efficient manner.

First, you must outfit your M.U.L.E. at the store, and this is an important part of the game because the equipment your M.U.L.E. carries dictates the kind of colonization you can attempt. The object, of course, is to cause your investments to pay off more than those of your opponents.

There are 44 plots of land you can buy at auction, each with a monetary, as well as strategic, value. The planet, not unlike Earth, has three types of terrain: river areas, plains, and mountains, and each is particularly well suited for one type of activity. For example, food cultivation is done most effectively on a plot near the river, and mining for minerals should be



done in the mountains for the greatest reward. (Note to parents: *M.U.L.E.* was designed to appeal to both teens and adults. One of your options is to greedily spend a night at the local pub, gambling, in the hopes of increasing your wealth.)

It all sounds fairly realistic, and because the game is "refereed" by the computer it is even more so—the computer periodically "cheats," introducing the random element of luck to an otherwise strategic contest.

New World by Epyx, available for Apple II, TRS-80 (disk and cassette), \$29.95.

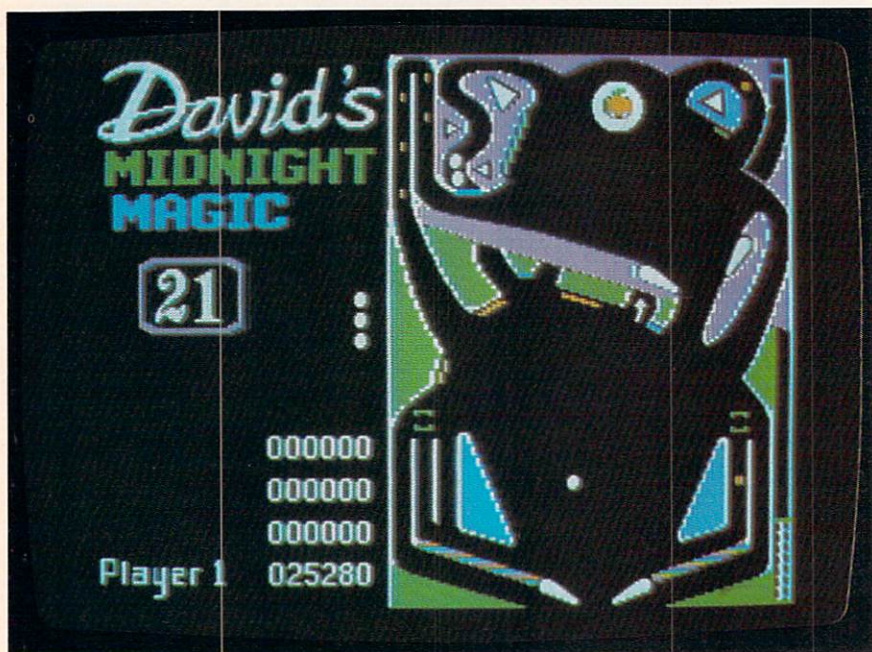
The *New World* consists of 13 potential colonies across North and South America that you, as monarch of England, France, or Spain, must try to establish for your very own. One, two, or three can play, but three is ideal because, for instance, when England takes a strong lead, France and Spain can join forces and try to take over English colonies.

In turn, players must purchase equipment and recruit crews to set sail for the *New World*. Once you've colonized a territory, you can dig for gold, attack the native population, or sit back and collect taxes from the colonists. (History does not recommend this last choice!) Don't count on anything in *New World* because the game is full of surprises, randomly generated to keep players on their toes.

The TRS-80 version is entirely text-based, and the Apple II adds a few graphic scenes, but nothing outstanding. Either version is good for youngsters since the game does not let you make mistakes or get confused. You are asked questions, given choices, and directed to the consequences. Recommended for the Columbus in all of us.

Ali Baba by Quality Software, available for

A text adventure. Deadline tests sleuths' skills in a race against the clock. Using interrogations, observations, and logic, players attempt to solve the mysterious homicide.



One of the more realistic computerized pinball games, David's Midnight Magic incorporates even the tilt feature.

Apple II/II plus/IIe, Atari 400/800 (disk), \$32.95; joysticks required.

This classic adventure game accommodates up to four players, each using his or her own joystick. Operation is simple enough for youngsters because the computer prompts you to move by displaying your choices. If you don't react within three seconds, the computer assumes you are resting this turn.

The scenario is familiar: The princess has been kidnapped, and you, Ali Baba, must find your way through the dangers of Arabia and rescue her. Players do not cooperate in this game, because the goal is to get to the princess first. One of the most interesting aspects of the game is the wide variety of weapons you can carry with you. Your turn will allow you to move according to factors such as your strength and what objects you are carrying. And if you find the game too difficult, you can change the skill level while playing.

The game is graphically appealing in high resolution, and the view is from overhead. *Ali Baba* is high fantasy, and though you have your share of battles that you can fight, remember that *Ali Baba* in myth was nonviolent. You will, of course, encounter potentially violent situations: daggers and poison and untrustworthy characters. Protect yourself, build strength, and leave avoidable fights behind you. *Ali Baba* is one of the best multiplayer games for Atari computers, and its variety of play options makes playing it over and over enjoyable, even after successful rescues.

Deadline by Infocom, available for Apple II/II plus/IIe/III, Atari 400/800/1200XL (disk), \$39.95; Commodore 64, IBM PC, Osborne, TI-99/4A (disk), \$49.95.

Deadline is an interactive murder mystery

whose object is to accuse the correct suspect with enough hard evidence by nightfall (a 12-hour game-time deadline). As the detective, you are provided with much more than a disk—you also get a lengthy interview with the characters, including the widow of the deceased, a police memo and lab report, a coroner's report, a letter from the crime scene, and a bag of tablets found near the body. And because you will never solve this crime without serious study of all the evidence off screen as well as on, the experience feels very real.

This is an excellent puzzle requiring logical thinking and clever, sometimes intuitive, deductions, which makes solving the case easier with more than one player. The entire game consists of text—there are no graphics on screen—but it's great text! Like other Infocom games, *Deadline* has a vocabulary of more than 600 words it can understand, most of which you have to discover by trial and error. Figuring out which words work is half the fun.

Using short or complex sentences you can walk anywhere in the house, examine anything you find (and send it to the lab for fingerprinting), and talk to the many suspects, some of whom hold valuable information. There are many possibilities to explore, and the game, like real life, doesn't wait for you to stumble on clues. If you aren't in the right place at the right time asking the right question, too bad—you'll have to look for the answer elsewhere!

ARCADE ACTION

David's Midnight Magic by Broderbund, available for Apple II plus/IIe, Atari 400/800/1200, and Commodore 64 (disk), \$34.95.

David Snyder, designer of the original Apple version of this game, will go down in history for his contributions to computer pinball design. The table is so beautifully created and the action is so similar to the real thing that you may find yourself reaching for a quarter to start a new game.

The game displays scores for one to four players, but if you think creatively, up to eight can play—pair into teams and let each control one flipper side. A set of flippers on the upper part of the table as well as one near the drop-out hole deepens the strategy and increases the action considerably from other computer pinball games.

Many of the trappings of real pinball have been figured into the design of the table—roll-overs, multiple balls in play, a tilt feature, and a memory for the high score once the disk is removed from the drive.

Maze Craze Construction Set by Data Trek, available for Apple II, 48K (disk), \$34.95.

This disk is just what its name sounds like: a tool box full of all the things you need to

create your own original maze/chase games that will make you forget about *Pac-Man*. Each of the 10 different basic boards represents a level of design and you can put them together in any order. You can also play the 10 different screens, some of which are quite challenging, before you try to create your own. In essence, each is like a little demonstration.

But the real fun comes when you make your own game, and don't be surprised if a good part of the fun is the building process itself. That's where you can use more heads than one to help design and play-test the screens. And, like model building or learning to paint, this can be a real opportunity for parent-child interaction while you are learning to program a computer in the easiest possible way.

You can alter the maze shape, creating endless winding passages or open, free-form boards. Dots, energizers, exit tunnels, and monsters are placed at will, along with a moving random bonus prize. And then you can fine-tune the board by giving the monsters individual levels of intelligence and setting your character's speed. If you don't like the looks of the premade game characters, you can use a graphics-generating device to create and color your own shapes.

This is a really marvelous program, and maze fanatics who own an Apple should not be without *Maze Craze*. It's simple enough for a child to operate, while complex enough to create high-quality videogames.

HONORABLE MENTION

Kaboom! by Activision, available for Atari 400/800 (cartridge), \$34.95.

Originally designed as a single-player "catch the bombs" game on the VCR, this version more than doubles the excitement by allowing a second player to control the movement of the bomber.

Computer Stocks & Bonds by Avalon Hill, available for Apple II/II plus/IIe, 48K (disk), 32K (cassette); Atari 400/800, 40K (disk), 32K (cassette); Commodore 64 (disk and cassette); TRS-80 I, III (disk and cassette); disk, \$25; cassette, \$20.

This electronic version of the classic board game accommodates up to four players. But because you can buy, trade, and sell at any time, not just in turn, the action is more frantic. And there's plenty of opportunity for under-the-table wheeling and dealing. A good family computer board game.

Wizard of Wor by Roklan, available for Apple II (disk), \$39.95; Atari 400/800 (cartridge), \$44.95.

The two-player version is a very cooperative game and a unique challenge. Players often find themselves walking through the monster-



filled labyrinths back-to-back, protecting each other. There's a good deal of violent activity—when played alone, it's a "get them or they get you" situation. But when played with two people, your behavior becomes more defensive than offensive, since one of your goals is to protect your partner. Nonetheless, the object remains to mow down all the monsters you can in an effort to get to the next maze. An excellent translation of the coin-operated game.

Lode Runner by Broderbund, available for the Apple II, 48K (disk), \$34.95; joystick required.

In this new ladder maze, which combines elements from many familiar games, your object is to recover loot from 150 different screens! But, more important, it has a game generator for creating your own screens and stringing them together into original games of *Lode Runner*. Another great family kit.

Murder on the Zinderneuf by Electronic Arts, available for the Atari 400/800 and Commodore 64 (disk), \$40.

This cleverly written murder mystery is set in a dirigible. To solve it you must "case the blimp," grill suspects, ask questions of appropriate people, and eventually make an accusation. This is a terrific game played by democratic vote at a party.

The Arcade Machine by Broderbund, available for the Apple II and Atari 400/800, 48K (disk), \$59.95.

This is a programming kit for creating your own arcade style shoot-'em-ups and is incredibly simple to operate. Players design attack formations, enemy speed and movements, and much more, including the graphic design of the characters themselves. **FC**

Murder on the Zinderneuf sends players airborne in a blimp, where they take the roles of famous detectives in solving a murder mystery.

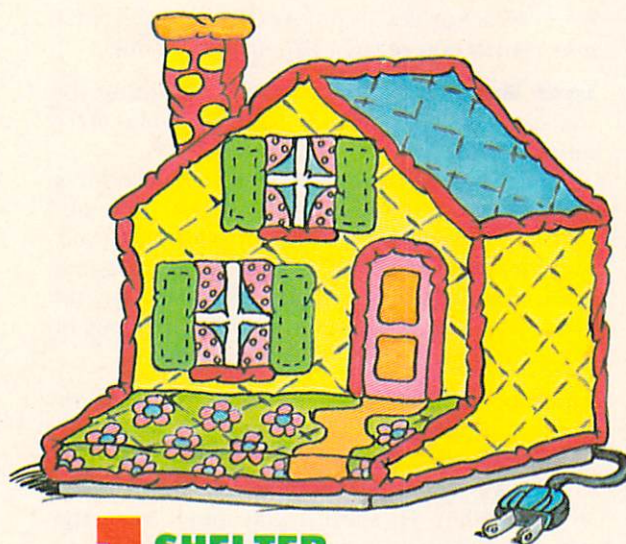
10 Gifts Your Computer Wants for Christmas

JUST A FEW NECESSARY FRILLS TO MAKE LIFE BETTER FOR BOTH OF YOU

BY P. GREGORY SPRINGER

**DO YOU THROW
THE TV UNDER
THE BED WHEN
YOU FINISH
WATCHING IT?**

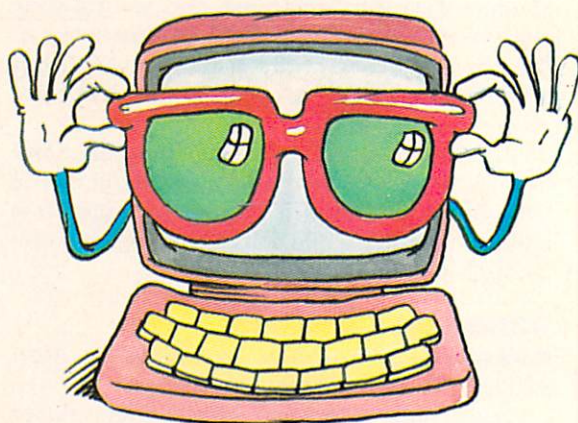
When I called up a catalog of my computer files last week, I got a surprise. My files hadn't been erased or tampered with, but there were 10 new ones. Where had they come from? I read them through and knew at once who'd authored them. It was my computer—or elves in the disk drive—who had snuck a few holiday gift requests onto my disk. I hate to admit it, but some were quite reasonable (and some were a bit pricey). I finally concluded that what's good for my computer is probably good for me, too.



1 SHELTER

Computers need roofs over their heads, too. Over time, dust will destroy disks and gum up keyboards. For less than \$50, you can buy quilted dust covers for computers and peripherals, if you like the homespun look (Quilted Dust Covers, Covers A Lot, P.O. Box 369, La Honda, CA 94020). Canvas covers with monogrammed letters and brand logos also add a more personal touch than ordinary plastic see-through kinds. But the most appreciated gift may be the simplest and least expensive: Buy a large piece of attractive fabric, hem the

edges, fold and sew boxed triangular corners, and—voila!—your computer knows you really care. [See "How to Make Your Own Computer Cover for Just a Few Dollars," p. 81.]



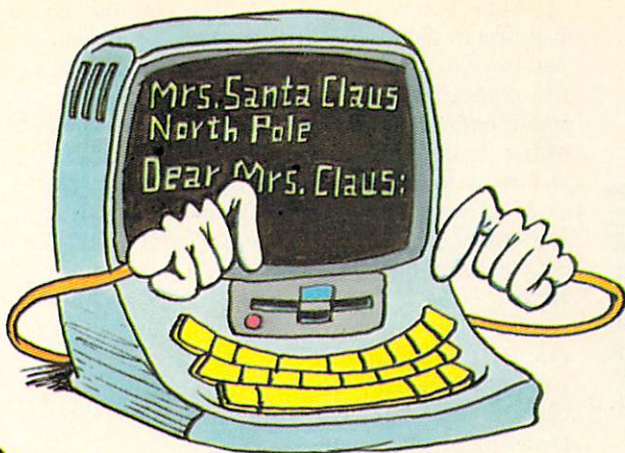
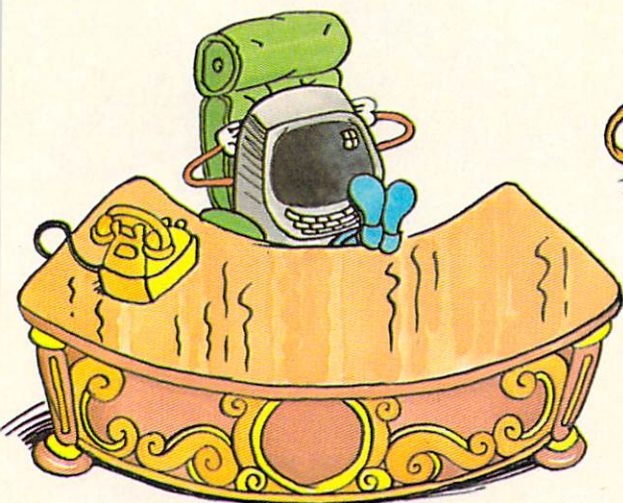
2 SHADE

Screen glare or reflections, caused by sunlight or electric light, can cause eyestrain. A tinted stick-on screen may help lessen that ache. Some commercial screens are leaded to prevent potentially harmful rays from passing through. Others simply restrict the glare from overhead or outside lighting.

The stick-on screens may be flat or molded, and made of glass or plastic. The SDC Antiglare Screen is a woven mesh of synthetic material that allows light from the CRT to pass through, but reflects no other light at all (SDC Antiglare Screen, Screen Data Corporation, 240 Cedar Knolls Rd., Cedar Knolls, NJ 07927; \$44.50). Some people insist that a colored sheet of acrylic, bought for less than a dollar at an art supplies store, will serve the purpose as well as anything—and then you can choose among violet, orange, chartreuse, blue, or any other color, not just the traditional green or amber.

P. GREGORY SPRINGER, a freelance writer from Urbana, Illinois, is a correspondent for The New York Times and Variety.

Alternatively try a monitor tilt stand, which allows you to rotate the monitor and tilt it back and forth to avoid glare (Microcomputer Accessories, Inc., 1545 Pontius Ave., Los Angeles, CA 90025).



For typing, composing, and editing, a well-supplied word-processing library will almost let your computer do your homework for you. Test before you buy, if possible. Some word-processing programs are quirky and cumbersome. And price varies tremendously. The powerful little *Zorlof*, which I use on my TRS-80, has many capabilities available only on other software costing four times as much.

IF YOU'RE GOING TO HAVE A COMPUTER IN THE HOUSE, MAKE IT WRITE.

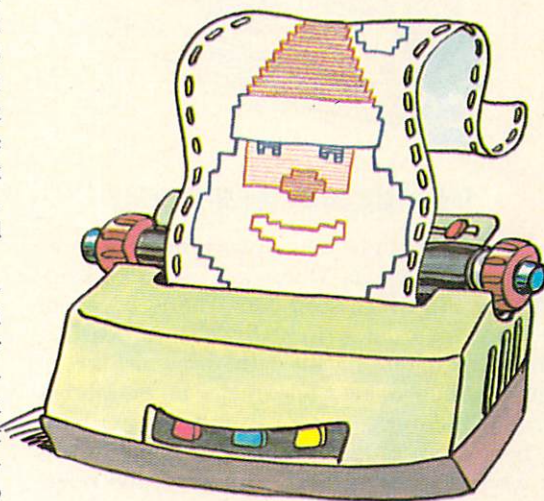
3. SPACE

Still stuffing your beloved electronic workhorse into the closet after hours? Is that any way to treat a member of the family? Do you throw the TV under the bed when you finish watching it? Most computers really want rooms of their own, including a lock on the door. That may not always be possible, but at least give your computer some protected space, safe from spilled milk or last year's stacked baseball bats.

Find a corner where the computer can reside full time. A regular office desk will hold most computers, although carpenters in our town have found that simple tabletops renamed as "computer desks" are bringing in a lot of business. [See "How to Build a Compact Computer Console for \$25," in the Premier issue of *FAMILY COMPUTING*, and look for "How to Build a Computer 'Murphy Bed'" in the January issue.]

4. WRITING SUPPLIES

If you're going to have a computer in the house, make it write. First, learn to type. There are learn-to-type programs for many computers, which teach your fingers how to fly over the keyboard. Next, choose a word-processing program with the capabilities you need: search/replace, move or erase blocks of text, underlining, etc. [See "Word Processing," on page 58.] In addition, grammar checkers can tell you when your wording is archaic or awkward (but they won't know if verbs agree with nouns), and spelling checkers will catch you when you write *nieghbor* or *Holloween* (but they can't tell when *weigh* should be way).



5. HARD COPY

It's easier to write a thank you note or a term paper or a business letter with a computer, but isn't it a waste of time without a printer? Choosing which printer to buy can be as complicated as buying a computer. Do you need a thermal, dot-matrix, or letter-quality printer? Graphics capability? A serial or parallel interface? Will the printer work with your software? The cost has dropped amazingly for certain dot-matrix printers, and if all you need is a printed record of your work, these are fine. Letter-quality printers, whose output is virtually indistinguishable from expensive typewriters, are higher priced, bigger, noisier, slower—and considered by some to be more wonderful all around. [See "Buyer's Guide to Printers" in the November issue.]

**RISE FROM AN
8K WEAKLING
TO A 64K
MEMORY
MASTER IS
SOMETHING ALL
LITTLE
COMPUTERS
ASPIRE TO.**

Once you've chosen a printer, you may find it detracts from your time on the computer. If you have to print out multiple or very long files, the computer has to wait for the printing to finish before it frees up for use again. A printer buffer is another useful piece of hardware. It stores in memory the text you want to print, and lets you use the computer while the printing takes place. Buffers cost from \$200 to \$2,000, depending on how much memory they have.

Spoolers work like buffers. They are programs, imbedded in some software, that free the computer from the printer. Some word processors have spoolers built in, as do certain Disk Operating Systems.



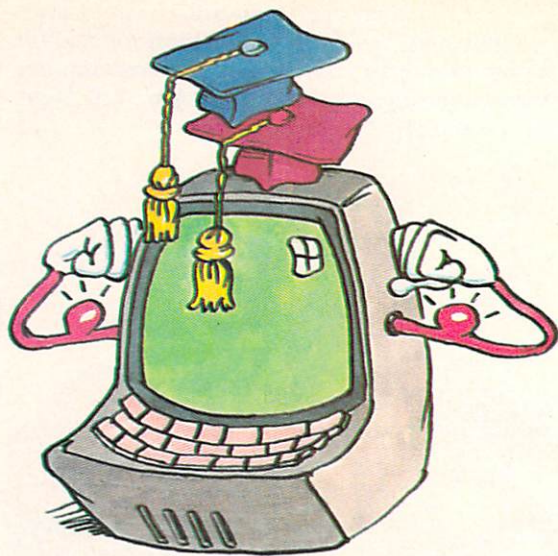
6. READING MATTER

The only way a working computer becomes obsolete is when its capacity is ignored by the user. Read. The rising ocean of ink from material written by, for, and about computers makes it hard to know where to begin and how to keep afloat. But take a stab at it. You'll find more uses for your computer with the help of an outside book or magazine. Unlike a refrigerator manual, your computer reference book isn't the last word on what you can do with the machine. It may be fairly impossible to read as well. Luckily, the computer book market is booming and you should keep an eye on texts that apply to your machine—for programs, hints, debugging tips, information exchange, balm and reassurance. A magazine subscription makes a nice, ongoing gift too.

7. MUSCLES

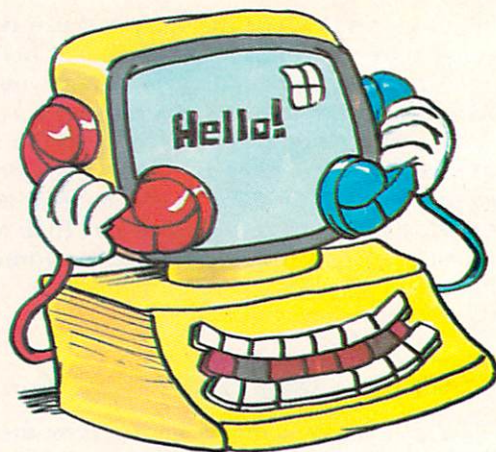
Rising up from an 8K weakling to a 64K memory master is something all little computers aspire to. Most computers have this ability to build up their strength, and it may pay to improve your computer to meet your growing needs.

There are many ways a computer can grow. Adding memory is just one of them. Some computers allow for a complete upgrade, easing the



inevitable threat of obsolescence. New Disk Operating Systems, such as the widely used CP/M, can be incorporated by adding peripheral boards or a floppy disk, thus opening up a vast supply of software. New programming languages, such as LOGO or PASCAL, may broaden your capacity to create and learn beyond BASIC.

A disk drive instead of a tape recorder, and/or an 80-column screen may also be used for your applications. Proceed with caution, though. A computer desk cluttered with unnecessary add-ons may detract from the practicality of the essential tool.



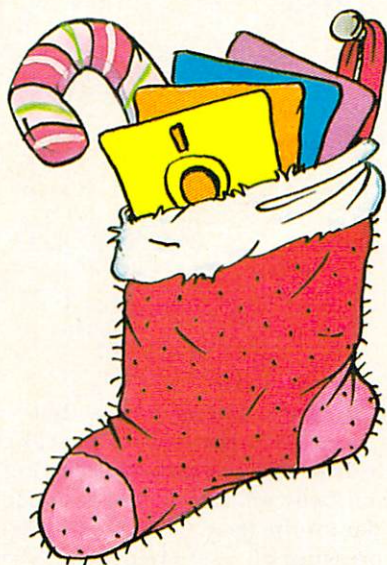
8. FAST TALK

A modem is a computer's link to the outside world. When all the brands and makes of computers get together over the phone, they speak the same language (ASCII). Human language should be so adaptable.

But once they call each other, what's there to talk about? Plenty. Modems and supporting software (called communications software or terminal software) can upload (transmit) and download (receive) many kinds of information:

games, electronic mail, merchandise orders, news, stock market quotes, movie reviews, entertainment directories, and club bulletins. And, they allow you to "chat" with another computer user, by typing in a message on the keyboard.

Modems cost between \$60 and \$600, depending on how fast they transmit data, their ability to answer and originate calls, or dial automatically. Because telecomputing will have a growing importance in the computer world, some new computers, such as the Kaypro and the TRS-80 Model 100, have built-in modems.



9. STOCKING STUFFERS

Floppy disks make the perfect stocking stuffers. Most computer owners can neither keep enough disks, nor keep them in order. Disks tend to fill up and foul up. A box of generic disks, costing about \$20 for a pack of 10, makes a fine gift.

You might also want to organize the disks you already have lying around your desk. Fancy plastic disk holders sell from \$15 to \$50, but a shoebox covered with colorful contact paper works well—another loving touch.

To aid in organization, consider color-coded disks. These are somewhat more expensive, but if you have trouble keeping track of disks the way some people do with keys, colored disks are what the doctor ordered. Red for financial data, green for addresses, blue for reports or letters, etc. (Rainbow Box Colored Disks, 10 disks in red, orange, yellow, green, and blue. Now available in other colors. Cen-Tech Inc., 183 Cottage Ave., Sandy, UT 84070; \$34.95.)

Another good idea is to have a duplicate set of disks—in case the dog eats the originals. For each working disk, you should have a backup copy. Making backups seems like a nuisance, but it doesn't take long. And sooner or later it will save you some time and effort, which makes the extra effort worthwhile.

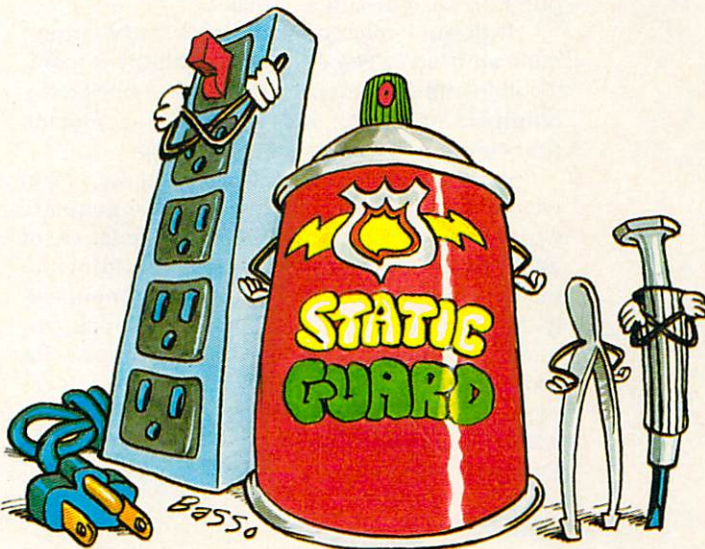
10. BODYGUARDS

It's pretty hard to hurt a computer, but accidents do happen. Spilled milk, blueberry muffin crumbs, and surges or drops in electric power are the most likely culprits. So keep some tools handy. A set of miniature screwdrivers (including Phillips), wrenches, and tweezers can be used to tighten loose wires or parts, and to reach foreign substances gumming up the works. Tweezers are particularly helpful for getting jammed paper out of printer wheels. A small typewriter brush and/or a small vacuum cleaner is great for keeping your keyboard in spit-and-polish condition.

As for glitches in the power line, preventive medicine is in order. Various products to regulate the flow of electric power exist, from simple multiplug power strips—which hold all the plugs for computer and peripherals and regulate minor surges—to uninterruptible power systems that actually take over power for 20 minutes in case of a blackout (Electronic Protection Devices, Inc., P.O. Box 673, Waltham, MA 02254). During thunderstorms, it's not a bad idea to unplug the computer altogether—lightning can send hardware-damaging shock waves through the power lines.

Static electricity, leaping off your winter rug and clothes, may not harm the hardware, but it can cause the program you're working on to go berserk. A hard plastic floor covering under the computer desk can help, as will the household spray for "static cling," Static Guard. This can be found at many drug and grocery stores.

DURING THUNDERSTORMS, IT'S NOT A BAD IDEA TO UNPLUG THE COMPUTER ALTOGETHER—LIGHTNING CAN DAMAGE HARDWARE.



Well! Very few stones left unturned on this list! I don't expect to fulfill all these requests this year, but I do see the virtue in all of them. Shelter, shade, and space, for instance, all make the computer more accessible and easier to use. And everything else will make the computer more powerful, and thereby expand its usefulness to me. I'm sure that's what the computer had in mind. ☐

How People and Machines Can Work in Harmony

PART TWO OF A SPECIAL REPORT ON ERGONOMICS

BY JANE WOLLMAN

It happens to most families when they buy the first computer for their home. Everyone is so excited about learning how to handle the machine that no one gives much thought to the table and chair used for working at it. Any available furniture will do, new owners simply assume. And so family members—who may range a great deal in size—wind up sitting on folding kitchen chairs and perching the computer on card or coffee tables.

It doesn't take long to discover that these makeshift arrangements can be highly uncomfortable and may even cause painful backache, cramped muscles, and eyestrain—problems that can reduce the joy of computing.

Fortunately, these disturbing side effects can be prevented by setting up an ergonomic work center. Ergonomics is the science of adapting equipment and working conditions to meet human needs. And by using ergonomically designed furniture and accessories, you can make the hours spent at your computer a lot more comfortable—and productive. (Last month, in part one of this report on ergonomics, we described guidelines and useful devices for avoiding eyestrain and noise from printers.)

CHAIRS

Buying a chair that properly supports the small of your back is the first step to ache-free computing. Dennis Meyers, a television engineer living in New Rochelle, New York, learned this the hard way from months of sitting in a bridge chair at his home computer screen. "After an hour or so, I'd begin to squirm around," he says. "And then when I stood up to go to another part of the desk, the chair would sometimes fold up and collapse behind me."

You'll want a swivel chair on self-locking

casters, with short, recessed arms that will let you move in close to the desk. The seat ought to be fairly firm, and you should be sitting with most of your body weight on your buttocks and your feet flat on the floor. This distribution will take the pressure off your thighs; such stress, if excessive, can lead to restricted circulation and, eventually, to blood-vessel damage. By all means, take lots of time to try out chairs in the store before buying.

The best-designed chairs allow you to vary the height of both seat and back, and provide continuous support as you lean forward and back. These chairs also are pneumatically controlled—using cylinders of compressed gas—and can be precisely adjusted by pressing levers while you're seated. Some of the more adaptable pneumatic chairs include Alma Desk Company's Zucomat Series, priced from about \$535, and the Prima II series, about \$435, from Martin Instrument Company, which features tiltable seats as well.

DESKS

Once you've found the right chair, the next consideration should be the work surface. "What you're looking for is a harmonious relationship between the table, keyboard, and chair," notes Michael Wodka, a senior associate at an Ann Arbor, Michigan, research and office-consulting company.

There is a growing selection of computer desks, tables, and stands, priced from about \$60 to almost \$2,000, designed especially for home use. Besides your physical comfort, when choosing a work station you must also keep in mind the size of your computer, the uses you put it to, and any near-term equipment-expansion plans.

JANE WOLLMAN is also the author of "A No-Hassle Way to Shop?" in this issue. Part one of her report on ergonomics was published last month.

ELBOWS FLEXED AT
90 DEGREE
ANGLE

REDUCE PRESSURE
ON THIGHS

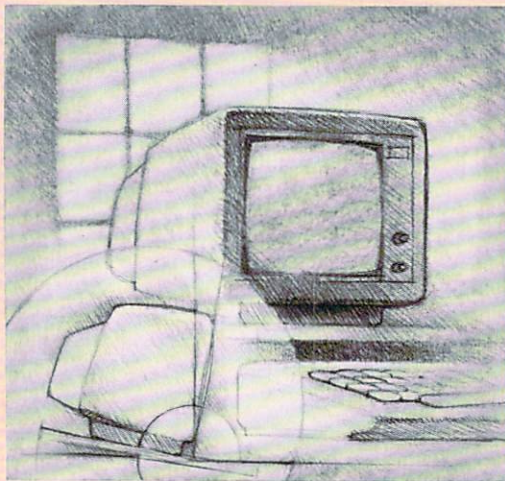
AVOID BACKACHE
AND NECKACHE

— CORRECT FORM —
WEIGHT ON BUTTOCKS
FEET FLAT ON FLOOR

A CAPSULE GUIDE TO AN ERGONOMIC WORKSTATION

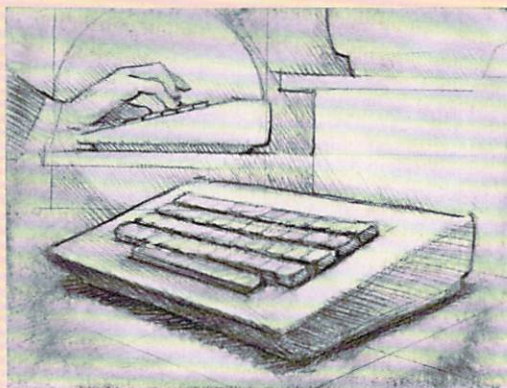
**KEEPING ELBOWS
FLEXED AT A 90-
DEGREE ANGLE IS
CONSIDERED
THE MOST
COMFORTABLE
POSITION.**

To enjoy the most comfortable, convenient and carefree computing, you should keep the following suggestions in mind.



SCREEN

1. To avoid glare, don't place the display facing a window.
2. Use a low-glare screen, or place an antiglare filter over the screen.
3. Tilt the screen so that a minimum of light is reflected on it.
4. The top of the display should be at eye level.
5. Is the resolution sharp enough for the work you need to do? (A higher resolution is better for word processing or spreadsheet work because of the large amount of text.)
6. People who use computers for long periods of time should tell their eye doctors during annual exams. A doctor may want to prescribe special lenses.

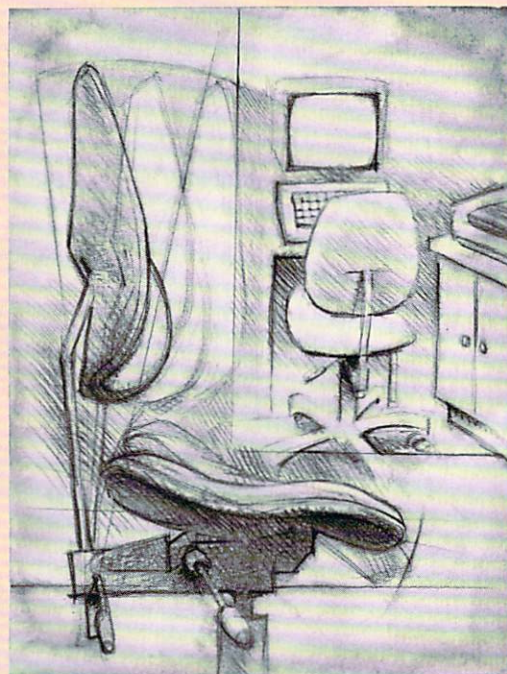


KEYBOARD

1. Detached units are often more comfortable and convenient.
2. If you'll be doing a lot of word processing, consider using a palm rest.

PRINTER

1. Thermal printers are quieter than impact printers.
2. To muffle noise, place the printer in an acoustical cabinet lined with foam.
3. Carpet the floor—but use carpeting woven with antistatic threads or an acrylic mat that automatically discharges static when stepped on.
4. If your printer is apt to vibrate a nearby computer, consider moving it to a separate table so as not to disturb the unit.
5. Those who can afford it may want to insulate the entire workroom.



CHAIRS

1. Look for a swivel chair on self-locking casters with short, recessed arms.
2. The chair must properly support the small of your back, and you should be able to vary the height of both seat and back.

DESK

1. The desk must work together with your chair, table, and other accessories.
2. Keep in mind the size of your computer, the uses you plan to put it to, and any expansion plans.
3. Sitting with your elbows flexed at a 90-degree angle is considered the best position for keying in data.
4. Ideally, the keyboard and monitor surfaces should be separate, so they can be raised, lowered, or tilted.

Once again, focus on adjustability. Ideally, both keyboard and video display surfaces should be separate, or articulated, sections that can be raised, lowered, and tilted according to your needs. Sitting with your elbows flexed at a 90-degree angle is considered the most comfortable position for keying in data; and both desk and chair should be adjusted accordingly, advises Richard Koffler, publisher of *The Ergonomics Newsletter*, in Santa Monica, California.

The most flexible work station units typically come designed as computer stands, which are also narrower and take up less space than desks or tables. Two intelligently planned stands are Rangine Corporation's triple-tier articulated system, priced at \$450, and Taylor Woodcraft's \$349 pedestal stand. The latter's height is pneumatically controlled, and it has a keyboard ledge adjusting from 22 to 28 inches high.

Next to work stations with adjustable surfaces, the most beneficial desks and tables come with a keyboard shelf permanently fixed a few inches lower than the rest of the desk to make typing more comfortable and a rear raised platform to elevate the video display.

Ergonomic computing can also include the convenience of keeping materials within arm's reach; and many desks are available with shelves and cabinets to store peripheral equipment, manuals, paper, and other supplies. One of the more reasonably priced and well-appointed systems is Gusdorf Corporation's #4270 desk and #4290 hutch, together costing \$258, which includes a lap drawer and five shelves. The display ledge is height-adjustable and can be mounted on either the right or left side.

Look for other special features available with some desks, such as single-cord multi-outlet packs for plugging in equipment cables; compartments for holding disk drives and diskettes; a built-in telephone jack; and metal static strips for discharging electrical static, which can interfere with computer functions.

KEYBOARDS

Although chances are the keyboard won't be the predominant factor in your choice of computer, you might keep in mind that the detached type—as opposed to one that comes as part of the processing unit—is more comfortable and convenient to use. You can position it virtually anywhere on the desk, and, when you're not typing in data, you can slide it out of the way to, for instance, make room to write in longhand. In addition, many desks come with separate dropped ledges on which to place the keyboard.

No matter which keyboard you use, if word processing is a major activity, you may want to purchase a foam-filled palm rest, such as one from Litton Business Furniture, priced at \$25. It clamps onto the edge of the desk or ledge and reduces strain from long periods of typing.

PRINTER TABLES

Many computer desks come equipped with special slotted surfaces to feed paper to a printer. But if your printer is one that's apt to vibrate the computer standing next to it, you might like to invest in a separate printer table, priced from \$100.

The most efficiently designed units will have a shelf to hold the supply of paper and some provision to catch completed printouts. (You can, however, attach a separate basket to accumulate "hard" copy at the rear of almost any printer table.) If you buy a separate printer table, be sure it can be used with the type of printer—bottom- or rear-feed—that you own. Some tables, however, can accommodate both types of paper feed.


ACCESSORIES

Like palm rests and monitor turntables (the latter discussed in last month's issue), there are a number of computing accessories available to boost your comfort level. For instance, you could consider a pair of nonslip footrests if your feet don't quite reach the floor or if you are prone to back strain. (Don't use phone books—they slide around.) Two footrests give you more flexibility to roll from place to place along the length of your desk. One reasonably priced model, at \$27.95, is made of steel, topped with ribbed rubber, and can be purchased from Misco Computer Supplies and Accessories, a New Jersey mail-order company.

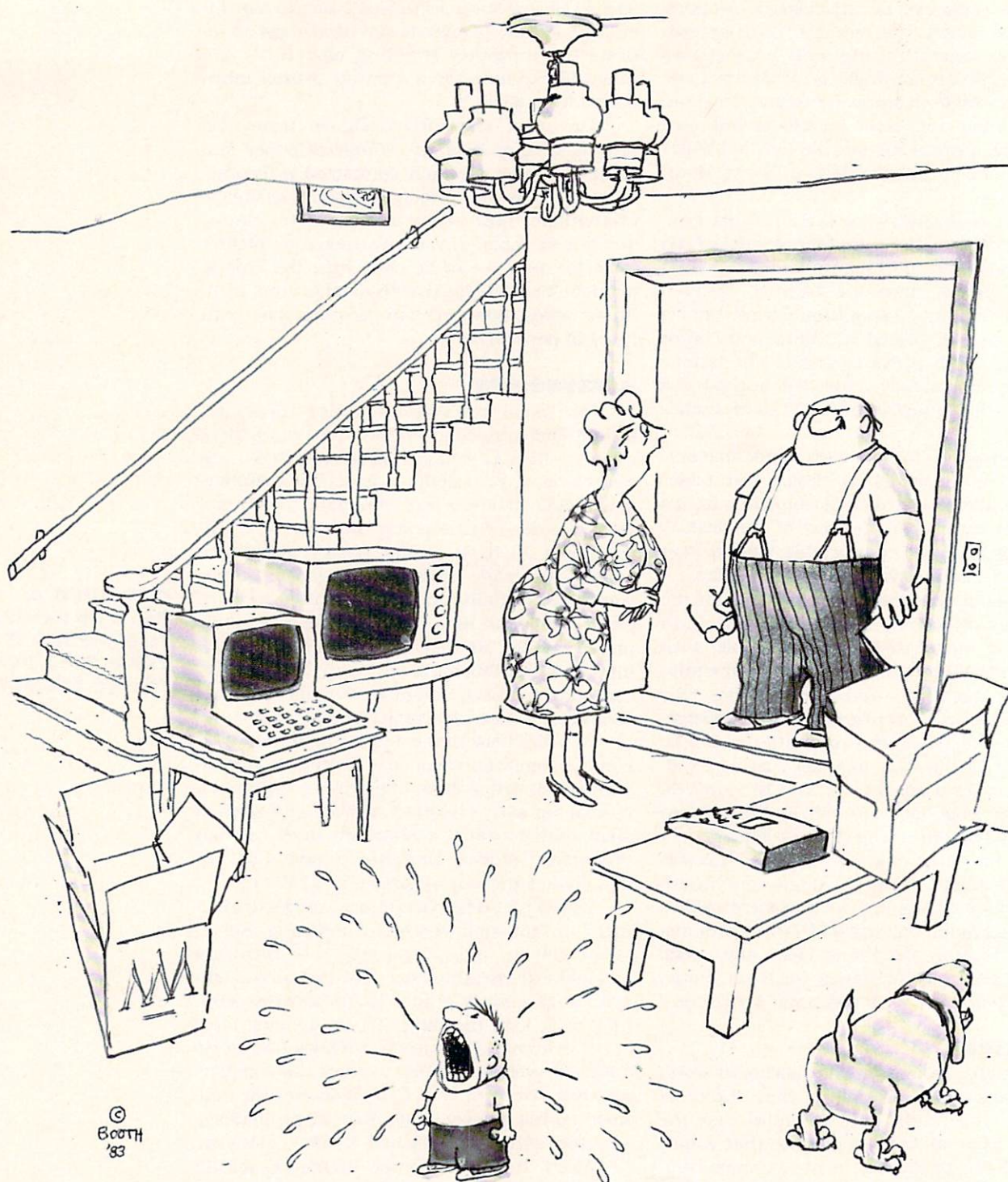
Another item that could come in handy—if you are somewhat reluctant to replace your favorite desk with a computer work station—is a special top with a lowered, adjustable keyboard shelf that converts a standard desk into an ergonomic model. Hamilton-Sorter Co., for one, makes these tops, priced at \$149.

Happily, it doesn't require a major investment to find comfort while computing. Sometimes just an inexpensive piece of furniture can make all the difference. For instance, Richard Lang, a ninth-grader in Franklin Square, New York, kept his computer on a snack table in his bedroom. To reach it, Richard had to sit hunched over on the bed to work the computer, while straining to see the video screen that stood on his dresser. Then the Langs installed a table with an attached display platform.

Apart from remedying Richard's aching neck and back, the table also provides room for peripheral equipment the family plans to add this year. "Before, the only way to have space for everything was to keep buying more snack tables," says Richard's mother, Joann. "That would have become pretty hairy."

But the ergonomic home computer center—designed to meet human needs—means more than merely working at a neat, uncluttered desk. It can make the difference between suffering chronic aches and pains from twisting and turning at the computer or keeping your feet on the ground and staying healthy. 

**CONSIDER A
PAIR OF NONSLIP
FOOTRESTS IF
YOUR FEET DON'T
REACH THE FLOOR.**

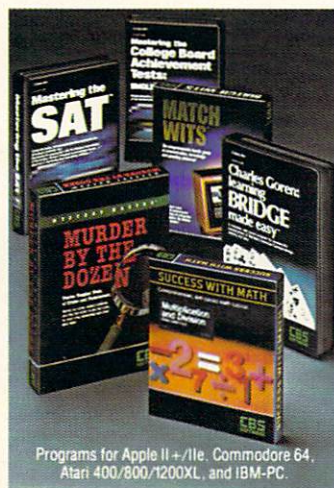


*"To get flexibility out of his new machines
Oliver needs some kind of doodad.
Norman, run down to the store and get him a doodad or two!"*



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The two buttons (for separate functions) on the grip make one-hand play possible, and this is a real advantage. However, if your trigger fingers tire, you can simply switch to two-hand control by employing the two fire buttons on the controller base. The grip itself is contoured and unbelievably comfortable, and the easy-read Numeric Keypad allows you to select game levels and number of players. The Quickshot III also features self-stabilizing suction cups and a convenient extra long cord.

If you're tired of coming out second best to those tough (but fun) Colecovision games, pick up the Quickshot III. And show 'em who's boss.

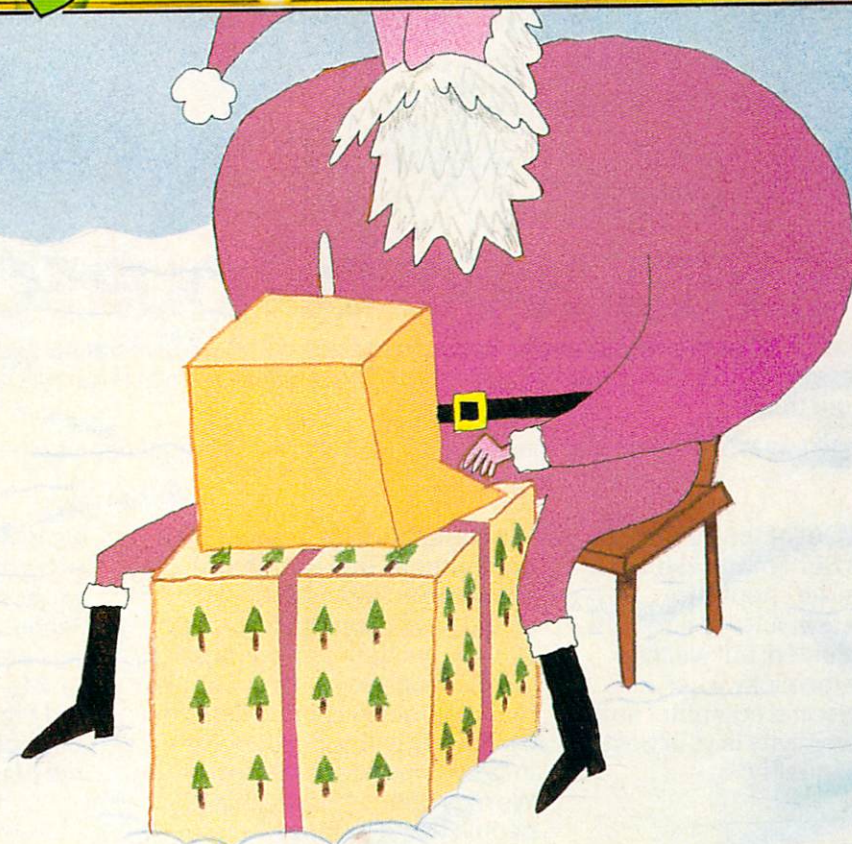
- Two sets of Independent fire buttons.
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- Built-in suction cups.



SPECTRAVIDEO™

Quickshot™ III

the PROGRAMMER



ILLUSTRATIONS BY JOSHUA GOSFIELD

★ D E C E M B E R ★

HOLIDAY PROGRAMS

Page 110

Three programs to make your holiday season a special one with the help of your computer.

PUZZLE

Page 140

Can you find your mother in a crowded department store? Your only clues are the people on her gift list.

READER-WRITTEN PROGRAM

Page 144

Baffle your friends—write a letter in code! A program that lets you create your own character sets on the Atari.

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Cherry



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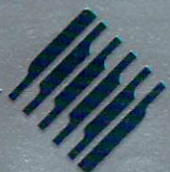
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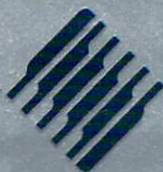
Dealer inquiries invited.

*Requires 16K expander for VIC-20. Available on disk or cassette for both the Commodore 64 and VIC-20.

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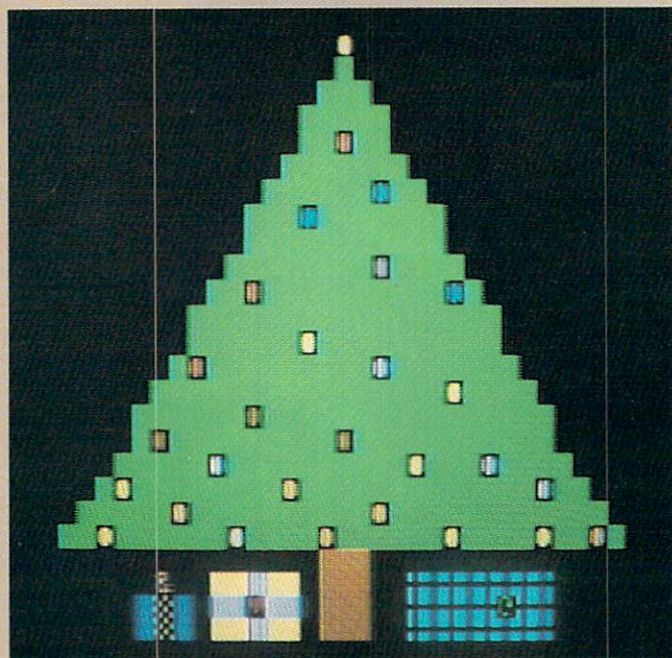
SOFTWARE



LIBRARY

CHRISTMAS TREE

BY JOEY LATIMER



The Commodore 64 version of Christmas Tree

As the snow falls outside, your family can gather 'round the computer with glasses of eggnog and fall under the spell of our *Christmas Tree* program. Watch your computer trim a tree on the screen and

surround its base with beautifully wrapped presents, while the tree lights flicker to the familiar tune of an old Christmas song. [Note: The TRS-80 Models I & III and Timex versions do not include music.]

Apple/Christmas Tree

```

10 HM = PEEK(116) * 256 + PEEK(115)
20 HIMEM: HM - 23
30 DIM LIGHT(50),BOX(3,2),S(64)
40 GR
50 POKE -16302,0
60 CALL -1998
70 INC = 2
80 COUNT = 19
90 COLOR = 4
100 FOR A = 7 TO 33
110 HOLD = A
120 FOR B = 1 TO 2
130 GOSUB 2000
140 NEXT B
150 COUNT = COUNT - 1
160 INC = INC + 2
170 NEXT A
180 READ C,L,H,X
190 IF C = -1 THEN 250
200 COLOR = C
210 FOR A = L TO H
220 VLIN X,44 AT A
230 NEXT A
240 GOTO 180
250 COLOR = 13
260 FOR A = 1 TO 13
270 READ F,G
280 PLOT F,G
290 NEXT A
300 FOR A = 1 TO 3
310 READ BOX(A,1),BOX(A,2)
320 NEXT A
330 FOR A = 12 TO 17
340 COLOR = 10

```

```

350 IF A <> INT(A / 2) * 2 THEN 400
360 PLOT A,BOX(1,1)
370 PLOT A,BOX(2,1)
380 PLOT A,BOX(3,1)
390 GOTO 430
400 PLOT A,BOX(1,2)
410 PLOT A,BOX(2,2)
420 PLOT A,BOX(3,2)
430 NEXT A
440 COLOR = 13
450 FOR A = 36 TO 44
460 TEMP = A
470 COLOR = 3
480 IF TEMP = 2 * INT(A / 2) THEN HLINE 24,28 AT A
490 NEXT A
500 COLOR = 1
510 FOR A = 30 TO 36
520 VLINE 42,44 AT A
530 NEXT A
540 COLOR = 2
550 HLINE 30,36 AT 43
560 PLOT 33,42
570 PLOT 33,44
580 FOR A = 1 TO 50
590 READ LIGHT(A)
600 NEXT A
610 COLOR = 5
620 VLINE 4,6 AT 20
630 COLOR = 3
640 PLOT 20,3
650 LCOUNT = 1
660 FOR X = 0 TO 22
670 READ Y
680 POKE(HM - 22 + X),Y
690 NEXT X
700 FOR A = 1 TO 64
710 READ S(A)
720 NEXT A
730 VAR = 31
740 GOSUB 1000
750 VAR = 63
760 GOSUB 1000
770 VAR = 31
780 GOSUB 1000
790 COL = INT(RND(1) * 9) + 1
800 IF COL > 2 AND COL < 6 THEN 790
810 COLOR = COL
820 PLOT 20,3
830 FOR I = 1 TO 500
840 NEXT I
850 GOTO 730
1000 FOR B = 1 TO VAR STEP 2
1010 X = S(B)
1020 Y = S(B + 1)
1030 Y = 49980 / Y
1040 X = X * (400 - Y) * .25
1050 I = INT(X / 256)
1060 J = X - 256 * I
1070 POKE 6,J
1080 POKE 7,I
1090 POKE 8,Y
1100 CALL HM - 22
1110 IF LCOUNT < 50 THEN COLOR = INT(RND(1) * 9) + 1
1120 PLOT LIGHT(LCOUNT),LIGHT(LCOUNT + 1)
1130 LCOUNT = LCOUNT + 2
1140 IF LCOUNT >= 50 THEN LCOUNT = 1
1150 NEXT B
1160 RETURN
2000 PLOT COUNT,A
2010 FOR C = 1 TO INC
2020 PLOT COUNT + C,A
2030 NEXT C
2040 A = HOLD + 1
2050 RETURN
3000 DATA 8,19,21,35,11,3,5,38,11,7,10,37
3010 DATA 5,8,8,37,2,12,17,39,9,24,28,36

```




For families who are serious about FUN...

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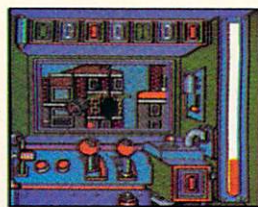
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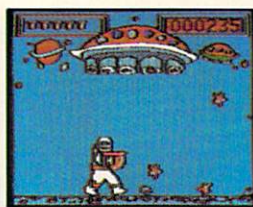
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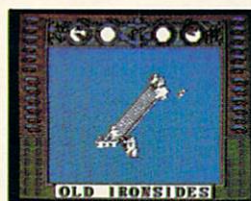
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Weekly Reader Family Software

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Middletown, CT 06457

HOLIDAY PROGRAMS

```

3020 DATA 1,30,36,42,-1,-1,-1,-1
3030 DATA 4,38,4,39,3,40,4,40,5,40,3,41,4,41
3040 DATA 5,41,3,42,4,42,5,42,4,43,4,44
3050 DATA 40,42,44,39,41,43
3060 DATA 21,9,24,20,21,11,19,11,24,15,21,16
3070 DATA 16,21,26,34,8,33,30,26,19,22,17,16
3080 DATA 32,33,10,27,25,25,21,26,14,24,18
3090 DATA 29,32,31,13,33,16,31,29,30,15,27,27
3100 DATA 30,8,30
3110 DATA 230,7,166,6,164,8,173,48,192,234
3120 DATA 234,234,136,208,250,202,208,242
3130 DATA 198,7,208,238,96
3140 DATA 2,196,3,262,1,262,4,262,4,294,3,330
3150 DATA 1,330,6,330,2,330,2,294,2,330,4,349
3160 DATA 3,247,4,292,4,262
3170 DATA 2,49980,2,392,2,393,2,330,6,440,2
3180 DATA 394,2,392,2,349,6,349,2,349,2,349,2
3190 DATA 294,6,392,2,349,2,349,2,330,4,330

```

Atari/Christmas Tree

```

10 GRAPHICS 11
20 READ C,X,Y,Z,D,F
30 COLOR C
40 PLOT X,Z
50 DRAWTO Y,Z
60 X=X-D
70 Y=Y+D
80 Z=Z+1
90 IF Z=F THEN 110
100 GOTO 40
110 READ C,X,Y,Z,F,S
120 IF X=-1 THEN 190
130 COLOR C
140 PLOT X,Z
150 DRAWTO Y,Z
160 Z=Z+S
170 IF Z>F-3 THEN 110
180 GOTO 140
190 READ P,D,X,Z
200 IF P=-1 THEN 310
210 FOR T=1 TO D STEP 2.5
220 SOUND 2,P,10,15
230 NEXT T
240 SOUND 2,0,10,0
250 C=INT(RND(1)*9)+1
260 IF C=7 THEN 250
270 COLOR C
280 PLOT X,Z
290 DRAWTO X,Z+2
300 GOTO 190
310 RESTORE 1080
320 GOTO 190
1000 DATA 12,40,40,8,.15,158,1,38,42,158,191
1010 DATA 1,4,19,34,169,191,1,7,52,60,169,191
1020 DATA 1,6,44,50,176,191,2,8,19,34,179,183
1030 DATA 1,8,25,26,169,191,1,14,25,26,165,170
1040 DATA 1,3,46,47,171,177,1,11,46,47,176,191
1050 DATA 1,2,52,60,175,178,1,2,52,60,180,184
1060 DATA 1,2,55,55,169,191,1,6,52,60,176,183
1070 DATA 1,-1,-1,-1,-1,-1,-2
1080 DATA 108,125,48,148,81,187,54,135,81,63
1090 DATA 29,106,81,375,42,42,72,125,27,149,64
1100 DATA 125,26,129,64,63,41,106,64,375,47,82
1110 DATA 64,125,38,37,72,125,50,124,64,125,43
1120 DATA 140,60,250,34,119,85,250,32,89,72
1130 DATA 250,37,100,81,250,39,69,0,125,31,140
1140 DATA 108,125,36,147,81,187,45,116,81,63
1150 DATA 39,130,81,375,43,77,72,125,35,62,64
1160 DATA 187,50,124,64,63,43,140,64,250,34
1170 DATA 119,64,125,32,89,72,125,48,148,64
1180 DATA 125,54,135,60,250,29,106,85,250,42
1190 DATA 42,72,250,26,129,81,259,41,106,0,125
1200 DATA 47,82,53,125,38,37,53,125,37,100,64
1210 DATA 125,39,69,48,375,31,140,53,125,36
1220 DATA 147,53,125,45,116,60,125,39,130,60
1230 DATA 375,43,77,60,125,35,62,60,125,50,124
1240 DATA 72,125,43,140,53,375,34,119,60,125

```

```

1250 DATA 32,89,60,125,48,148,64,125,54,135,64
1260 DATA 250,29,106,108,250,27,149,81,187,26
1270 DATA 129,81,63,41,106,81,250,47,82,72,250
1280 DATA 38,37,64,125,37,100,64,63,39,69,64
1290 DATA 375,31,141,64,125,36,147,72,125,45
1300 DATA 116,64,125,39,130,60,250,43,77,85
1310 DATA 250,35,62,72,250,50,124,81,250,50
1320 DATA 124,0,250,40,5,-1,-1,-1,-1
1330 DATA 39,130,81,375,43,77,72,125,35,62,64
1340 DATA 125,26,129,64,63,41,106,64,375,47,82
1350 DATA 47,82,53,125,38,37,53,125,37,100,64

```

Note: This program will not work on older Atari 400s.

Commodore 64/Christmas Tree

```

10 PRINT CHR$(147)
20 POKE 53280,0
25 POKE 53281,0
30 POKE 53281,0
40 READ B,CH,CO
50 IF B=-2 THEN 140
60 FOR Z=1 TO B
70 READ X,Y
80 FOR P=X+1000 TO Y+1000
90 POKE P,CH
100 POKE P+54272,CO
110 NEXT P
120 NEXT Z
130 GOTO 40
140 RESTORE
150 READ X,Y,Z
160 IF Z<>-2 THEN 150
170 V=54296
180 W=54276
190 A=54277
200 HF=54273
210 LF=54272
220 S=54278
230 PH=54275
240 PL=54274
250 POKE V,15
260 POKE W,17
270 POKE A,190
280 POKE PH,15
290 POKE PL,15
300 READ H,L,D,P
310 IF H=-1 THEN 140
320 POKE HF,H
330 POKE LF,L
340 FOR X=D-50 TO D-20
350 POKE S,136
360 NEXT X
370 FOR T=1 TO D/5
380 NEXT
390 POKE HF,0
400 POKE LF,0
410 POKE W,0
420 P=P+1000
430 POKE P,81
440 CO=INT(RND(1)*9)+2
450 IF CO=PEEK(P+54272) OR CO=3 OR CO=5 THEN
460 POKE P+54272,CO
470 GOTO 250
1000 DATA 20,160,5,83,83,122,124,161,165,201
1010 DATA 205,240,246,279,287,318,328,358,368
1020 DATA 397,409,436,450,475,491,515,531
1030 DATA 554,572,593,613,632,654,672,694
1040 DATA 711,735,750,776,789,817,828,858
1050 DATA 4,160,9,882,884,922,924,962,964
1060 DATA 1002,1004,2,160,6,952,954,992,994
1070 DATA 2,102,8,953,953,993,993,1,38,10
1080 DATA 913,913,2,160,7,916,920,996,1000
1090 DATA 3,160,4,918,918,956,960,998,998,1
1100 DATA 83,2,958,958,3,219,14,927,934,967
1110 DATA 974,1007,1014,1,0,5,972,972,-2,-2
1120 DATA -2,38,126,125,203,51,97,187,565,51
1130 DATA 97,62,857,51,97,375,805,57,172,250
1140 DATA 716,64,188,187,751,64,188,62,842,64

```


HOLIDAY PROGRAMS

```

1150 DATA 188,375,285,64,188,125,854,57,172
1160 DATA 125,321,64,188,125,727,68,149,375
1170 DATA 837,48,127,375,405,57,172,250,849
1180 DATA 51,97,250,673,0,0,125,794,38,126
1190 DATA 125,638,51,97,187,449,51,97,62,830
1200 DATA 51,97,375,521,57,172,125,774,64,188
1210 DATA 187,683,64,188,62,731,64,188,250
1220 DATA 555,64,188,125,760,57,172,125,438
1230 DATA 64,188,125,609,68,149,250,805,48
1240 DATA 127,250,794,57,172,250,760,51,97
1250 DATA 250,555,0,0,125,731,76,252,125,683
1260 DATA 76,252,125,774,64,188,125,521,86
1270 DATA 105,375,830,76,252,125,449,76,252
1280 DATA 125,683,68,149,125,794,68,149,375
1290 DATA 673,68,149,125,849,68,149,125,405
1300 DATA 57,172,125,837,76,252,375,727,68
1310 DATA 149,125,837,68,149,125,203,64,188
1320 DATA 125,565,64,188,250,857,38,126,250
1330 DATA 805,51,97,187,716,51,97,125,751
1340 DATA 51,97,250,774,57,172,250,521,64
1350 DATA 188,125,830,64,188,62,449,64,188
1360 DATA 375,716,64,188,125,751,57,172,125
1370 DATA 731,64,188,125,849,68,149,250,203
1380 DATA 48,127,250,683,57,172,250,555,51
1390 DATA 97,250,43,0,0,250,43,-1,-1,-1,-1

```

VIC-20/Christmas Tree

```

10 PRINT CHR$(147)
20 POKE 36879,8
30 READ B,CH,CO
40 IF B=-2 THEN 130
50 FOR Z=1 TO B
60 READ X,Y
70 FOR P=X+7000 TO Y+7000
80 POKE P,CH
90 POKE P+30720,CO
100 NEXT P
110 NEXT Z
120 GOTO 30
130 RESTORE
140 READ X,Y,Z
150 IF Z<>-2 THEN 140
160 POKE 36878,15
170 SP=36876
180 READ S,D,P
190 IF D=-1 THEN 130
200 POKE SP,S
210 FOR T=1 TO D+50
220 NEXT T
230 POKE SP,0
240 POKE V,0
250 P=P+7000
260 POKE P,B1
270 CO=INT(RND(1)*7)+1
280 IF CO=5 OR CO=PEEK(P+30720) THEN 270
290 POKE P+30720,CO
300 GOTO 160
1000 DATA 16,160,5,734,734,755,757,777,779
1010 DATA 798,802,819,825,841,847,862,870
1020 DATA 883,893,905,915,926,938,947,961
1030 DATA 969,983,990,1006,1012,1028,1033
1040 DATA 1051,1054,1074,5,160,1,1,1086,1086
1050 DATA 1108,1108,1130,1130,1152,1152
1060 DATA 1174,1174,2,160,7,1121,1128,1165
1070 DATA 1172,3,160,6,1124,1124,1143,1150
1080 DATA 1168,1168,1,0,1,1146,1146,2,102
1090 DATA 4,1154,1156,1176,1178,1,88,3,1133
1100 DATA 1133,2,160,4,1155,1155,1177,1177
1110 DATA 3,160,2,1114,1117,1136,1139,1180
1120 DATA 1183,4,62,5,1116,1116,1138,1138
1130 DATA 1158,1161,1182,1182,1,83,2,1160
1140 DATA 1160,-2,201,125,991,215,187,910
1150 DATA 215,63,1037,215,375,799,219,125
1160 DATA 1004,223,187,958,223,63,1068,223
1170 DATA 375,863,223,125,974,219,125,1062
1180 DATA 223,125,823,225,250,869,212,250
1190 DATA 1055,219,250,1073,215,250,928,0

```

```

1200 DATA 125,1021,201,125,991,215,187,910
1210 DATA 215,63,1037,215,375,799,219,125
1220 DATA 1004,223,187,958,223,63,1068,223
1230 DATA 250,863,223,125,974,219,125,1062
1240 DATA 223,125,823,225,250,869,212,250
1250 DATA 1055,219,250,1073,215,250,928,0
1260 DATA 125,1021,228,125,991,228,125,910
1270 DATA 223,125,1037,231,375,799,228,125
1280 DATA 1004,228,125,958,225,125,1068,225
1290 DATA 375,869,225,125,1055,225,125,1073
1300 DATA 219,125,928,228,375,1021,225,125
1310 DATA 991,225,125,910,223,125,1037,223
1320 DATA 250,799,201,250,1004,215,187,958
1330 DATA 215,63,1068,215,250,863,219,250
1340 DATA 974,223,125,1062,223,63,823,223
1350 DATA 375,869,223,125,1055,219,125,1073
1360 DATA 223,125,928,225,250,1021,212,250
1370 DATA 991,219,250,910,215,250,1037,0
1380 DATA 250,712,-1,-1,-1,-1

```

IBM PC/Christmas Tree

```

10 DIM MU(48,2),LI(19,2)
20 FOR I=1 TO 48
30 READ MU(I,1),MU(I,2)
40 NEXT I
50 FOR I=1 TO 19
60 READ LI(I,1),LI(I,2)
70 NEXT I
80 KEY OFF
90 CLS
100 L=1
110 T=40
120 FOR N=1 TO 18
130 A$=STRING$(L,219)
140 PRINT TAB(T);A$
150 L=L+2
160 T=T-1
170 NEXT N
180 A$=STRING$(3,219)
190 FOR B=1 TO 5
200 PRINT TAB(39);A$
210 NEXT B
220 LOCATE 21,24
230 A$=STRING$(5,177)
240 PRINT A$
250 PRINT TAB(24);A$
260 PRINT TAB(24);A$
270 LOCATE 22,30
280 A$=STRING$(8,176)
290 PRINT A$
300 LOCATE 23,30
310 PRINT A$
320 LOCATE 21,33
330 PRINT CHR$(145)
340 LOCATE 20,44
350 A$=STRING$(12,178)
360 PRINT A$
370 LOCATE 21,44
380 PRINT A$
390 LOCATE 22,44
400 PRINT A$
410 LOCATE 23,44
420 PRINT A$
430 LOCATE 21,49
440 COLOR 0,7
450 PRINT CHR$(21)
460 COLOR 7,0
470 CT=1
480 LM=24
490 GOSUB 1000
500 LM=48
510 GOSUB 1000
520 LM=24
530 GOSUB 1000
540 LOCATE 1,40
550 PRINT CHR$(186)
560 GOTO 480

```


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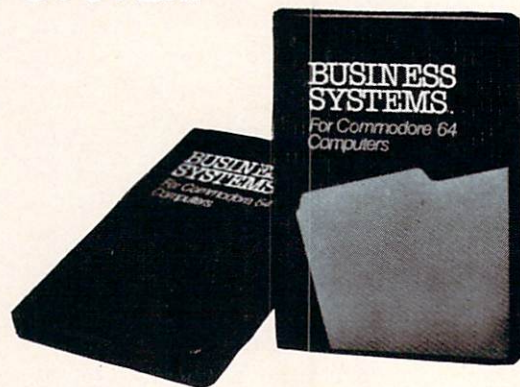
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HOLIDAY PROGRAMS

```

1000 FOR I=1 TO LM
1010 SOUND MU(I,1),MU(I,2)
1020 LOCATE LI(CT,1),LI(CT,2)
1030 CT=CT+1
1040 IF CT>19 THEN CT=1
1050 IF RND(1)<.2 THEN PRINT CHR$(219) ELSE P
PRINT CHR$(2)
1060 NEXT I
1070 RETURN
2000 DATA 293,6,392,6,392,6,392,6,32767,6
2010 DATA 440,6,32767,6,493,6,493,6,493,6
2020 DATA 32767,6,32767,6,493,6,440,6,493,6
2030 DATA 523,6,32767,6,369,6,32767,6,440,6
2040 DATA 32767,6,392,6,32767,6,32767,6
2050 DATA 587,6,587,6,493,6,659,6,32767,6
2060 DATA 32767,6,587,6,587,6,523,6,523,6
2070 DATA 32767,6,32767,6,523,6,523,6,440,6
2080 DATA 587,6,32767,6,32767,6,523,6,523,6
2090 DATA 493,6,493,6,32767,6,32767,6
2100 DATA 3,40,5,38,5,42,7,42,8,38,9,40,9,34
2110 DATA 10,44,11,38,11,46,12,35,12,49,13,41
2120 DATA 16,35,16,44,16,53,17,34,17,42,17,51

```

TI-99/4A/Christmas Tree

```

10 CALL CLEAR
20 CALL SCREEN(2)
30 A$="FF00FF00FF00FF00"
40 CALL CHAR(128,A$)
50 READ CS,CHAR,F,B
60 IF CS=-1 THEN 140
70 CALL COLOR(CS,F,B)
80 READ X,Y
90 FOR ROW=X TO Y
100 READ COL,REP
110 CALL HCHAR(ROW,COL,CHAR,REP)
120 NEXT ROW
130 GOTO 50
140 RESTORE 1130
150 READ DUR,FRE,ROW,COL
160 IF DUR=-2 THEN 140
170 CALL SOUND(DUR,FRE,0)
180 CO=INT(RND*12)+2
190 IF CO=13 THEN 180
200 CALL COLOR(3,CO,3)
210 CALL HCHAR(ROW,COL,48)
220 GOTO 150
1000 DATA 11,113,3,3,3,19,16,1,15,3,15,3
1010 DATA 14,5,13,7,13,7,12,9,11,11,11
1020 DATA 11,10,13,9,15,9,15,8,17,7,19
1030 DATA 7,19,6,21,5,23,12,120,11,11,20
1040 DATA 24,16,1,16,1,16,1,16,1,16,1,9
1050 DATA 96,6,6,22,24,6,9,6,9,6,9,5,64
1060 DATA 12,1,21,10,1,2,43,12,10,22
1070 DATA 24,10,1,6,9,10,1,8,91,14,16,23
1080 DATA 24,18,3,18,3,4,56,8,1,22,22,19
1090 DATA 1,13,128,9,16,21,24,22,5,22,5
1100 DATA 22,5,22,5,7,80,7,7,21,24,24,1
1110 DATA 22,5,24,1,24,1,10,111,7,1,22
1120 DATA 22,24,1,-1,-1,-1,-1
1130 DATA 125,294,15,18
1140 DATA 187,392,6,15,63,392,19,18,375
1150 DATA 392,12,11,125,440,17,22,187
1160 DATA 494,9,13,63,494,18,15,375,494
1170 DATA 16,12,125,494,19,6,125,440,19
1180 DATA 25,125,494,7,17,250,523,11,17
1190 DATA 250,370,13,20,250,440,10,20,250
1200 DATA 392,15,23,125,30000,9,13,125
1210 DATA 294,19,10,187,392,13,14,63,392
1220 DATA 15,18,375,392,7,17,125,440,16
1230 DATA 12,187,494,6,15,63,494,19,18
1240 DATA 250,494,12,11,125,494,17,22
1250 DATA 125,440,9,13,125,494,15,10,250
1260 DATA 523,16,12,250,370,19,6,250,440
1270 DATA 19,25,250,392,7,17,125,30000
1280 DATA 12,11,125,587,13,20,125,587,10
1290 DATA 20,125,494,15,23,375,659,17,8
1300 DATA 125,587,19,10,125,587,18,15

```

```

1310 DATA 125,523,15,18,375,523,7,17,125
1320 DATA 523,16,12,125,523,6,15,125,440
1330 DATA 19,18,375,587,12,11,125,523
1340 DATA 17,22,125,523,9,13,125,494,15
1350 DATA 10,250,494,16,12,250,294,19,6
1360 DATA 375,392,13,14,63,392,7,17,250
1370 DATA 392,11,17,250,440,13,20,125
1380 DATA 494,10,20,63,494,15,23,375,494
1390 DATA 17,8,125,494,19,10,125,440,18
1400 DATA 15,125,494,15,18,250,523,7,17
1410 DATA 250,370,7,17,250,440,6,15,250
1420 DATA 392,13,14,250,30000,3,16
1430 DATA -2,-2,-2,-2

```

Timex Sinclair 1000 w/ 16K RAM Pack/Christmas Tree

```

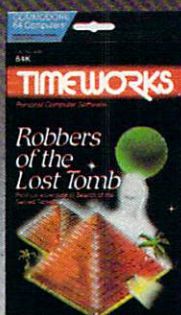
10 DIM A$(25)
20 DIM B$(2,5)
30 DIM C$(2,3)
40 FOR N=1 TO 25
50 LET A$(N)=CHR$(128)
60 NEXT N
70 LET B$(1)=CHR$(128)+CHR$(128)+CHR$(136)+CHR$(128)
80 FOR N=1 TO 5
90 LET B$(2,N)=CHR$(136)
100 NEXT N
110 LET C$(1)=CHR$(128)+CHR$(136)+CHR$(128)
120 LET C$(2)=B$(2, TO 3)
130 PRINT TAB 15;A$( TO 1)
140 PRINT TAB 14;A$( TO 3)
150 PRINT TAB 13;A$( TO 5)
160 PRINT TAB 13;A$( TO 5)
170 PRINT TAB 12;A$( TO 7)
180 PRINT TAB 11;A$( TO 9)
190 PRINT TAB 10;A$( TO 11)
200 PRINT TAB 10;A$( TO 11)
210 PRINT TAB 9;A$( TO 13)
220 PRINT TAB 8;A$( TO 15)
230 PRINT TAB 7;A$( TO 17)
240 PRINT TAB 7;A$( TO 17)
250 PRINT TAB 7;A$( TO 17)
260 PRINT TAB 6;A$( TO 19)
270 PRINT TAB 5;A$( TO 21)
280 PRINT TAB 4;A$( TO 23)
290 PRINT TAB 3;A$
300 FOR N=1 TO 5
310 PRINT TAB 14;A$( TO 3)
320 NEXT N
330 PRINT AT 18,4;B$(1);AT 19,4;B$(2)
340 PRINT AT 20,4;B$(1);AT 21,4;B$(1)
350 PRINT AT 18,10;C$(1);AT 19,10;C$(1)
360 PRINT AT 20,10;C$(2);AT 21,10;C$(1)
370 PRINT AT 19,18;C$(1);AT 20,18;C$(2)
380 PRINT AT 21,18;C$(1);AT 19,22;A$( TO 5)
390 PRINT AT 20,22;B$(2);AT 21,22;A$( TO 5)
400 UNPLOT 35,33
410 UNPLOT 27,30
420 UNPLOT 24,23
430 UNPLOT 16,17
440 PRINT AT 0,15;CHR$(138)
450 UNPLOT 38,29
460 UNPLOT 22,28
470 UNPLOT 25,28
480 PRINT AT 0,15;CHR$(131)
490 UNPLOT 31,28
500 UNPLOT 37,26
510 UNPLOT 19,23
520 PRINT AT 0,15;CHR$(138)
530 UNPLOT 29,22
540 UNPLOT 39,22
550 UNPLOT 20,16
560 PRINT AT 0,15;CHR$(131)
570 UNPLOT 26,16
580 UNPLOT 34,17
590 UNPLOT 42,16
600 PRINT AT 0,15;CHR$(138)

```


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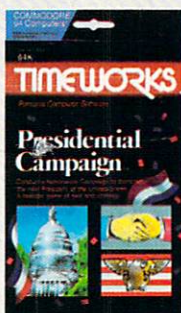
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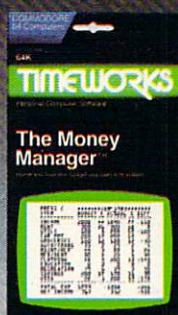
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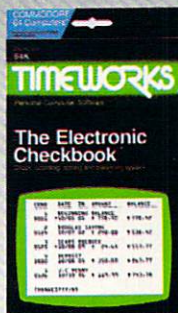
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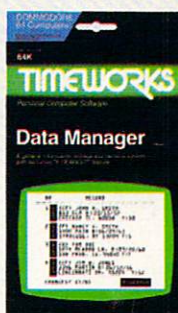
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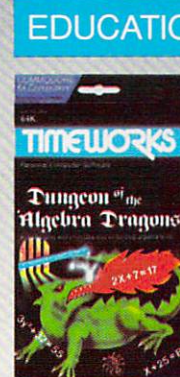
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HOLIDAY PROGRAMS

```

610 UNPLOT 21,13
620 UNPLOT 29,36
630 PLOT 25,28
640 PRINT AT 0,15;CHR# 131
650 PLOT 38,29
660 PLOT 19,23
670 PLOT 29,22
680 PRINT AT 0,15;CHR# 138
690 PLOT 39,22
700 PLOT 31,28
710 PLOT 22,28
720 PRINT AT 0,15;CHR# 131
730 PLOT 37,26
740 PLOT 29,36
750 GOTO 440

```

TRS-80 Color Computer/Christmas Tree

```

10 CLS(0)
20 V=1
30 L=31
40 R=31
50 FOR H=L TO R
60 IF V>23 THEN 130
70 SET(H,V,1)
80 NEXT H
90 V=V+1
100 L=L-1
110 R=R+1
120 GOTO 50
130 READ U,D,L,R,CO
140 IF U=-2 THEN 220
150 V=U
160 FOR H=L TO R
170 SET(H,V,CO)
180 NEXT H
190 V=V+1
200 IF V>D THEN 130
210 GOTO 160
220 RESTORE
230 READ DUM
240 IF DUM<>-1 THEN 230
250 CO=RND(7)+1
260 IF CO=1 THEN 250
270 READ N,D,H,V
280 IF H=-1 THEN 220
290 SET(H,V,CO)
300 SOUND N,D/16
310 GOTO 250
1000 DATA 24,31,30,32,2,26,31,11,17,8,29,29
1010 DATA 11,17,4,27,31,15,15,4,27,31,22,27
1020 DATA 6,27,31,24,24,7,29,29,22,27,7,29
1030 DATA 29,24,24,3,27,31,37,51,4,29,29
1040 DATA 37,51,1,27,31,46,46,3,29,29,46
1050 DATA 46,8,-2,-2,-2,-2,-2,-1
1060 DATA 108,125,32,4,147,187,43,19,147
1070 DATA 63,22,15,147,375,48,22,159,125
1080 DATA 19,19,170,187,36,9,170,63,24
1090 DATA 22,170,375,38,16,170,125,28,7
1100 DATA 159,125,31,13,170,125,31,19,176
1110 DATA 250,36,22,140,250,25,10,159,250
1120 DATA 12,22,147,250,39,12,255,125,32
1130 DATA 4,108,125,43,19,147,187,22,15,147
1140 DATA 63,48,22,147,375,19,19,159,125,36
1150 DATA 9,170,187,24,22,170,63,38,16,170
1160 DATA 250,28,7,170,125,31,13,159,125,31
1170 DATA 19,170,125,36,22,176,250,25,10,140
1180 DATA 250,12,22,159,250,39,12,147,250,25
1190 DATA 10,255,125,12,22,185,125,39,12
1200 DATA 185,125,32,4,170,125,43,19,193
1210 DATA 375,22,15,185,125,48,22,185,125
1220 DATA 19,19,176,125,36,9,176,375,24,22
1230 DATA 176,125,38,16,176,125,28,7,159,125
1240 DATA 31,13,185,375,31,19,176,125,36,22
1250 DATA 176,125,32,4,170,125,43,19,170,250
1260 DATA 22,15,108,250,48,22,147,187,19,19
1270 DATA 147,63,36,9,147,250,24,22,159,250
1280 DATA 38,16,170,126,28,7,170,63,31,13
1290 DATA 170,375,31,19,170,125,36,22,159

```

```

1300 DATA 125,25,10,170,125,12,22,176,250
1310 DATA 39,12,140,250,32,4,159,250,43,19
1320 DATA 147,250,22,15,255,250,31,1
1330 DATA -1,-1,-1,-1

```

TRS-80 Models I & III/Christmas Tree

```

10 CLS
20 X=1
30 X1=63
40 X2=63
50 Y=2
60 FOR Z=X1 TO X2
70 SET(Z,Y)
80 NEXT Z
90 X=X+1
100 X1=X1-1
110 X2=X2+1
120 Y=Y+1
130 IF X<>39 THEN 60
140 READ X1,X2,Y1,Y2
150 IF X1=-1 THEN 210
160 FOR Z=X1 TO X2
170 SET(Z,Y1)
180 NEXT Z
190 Y1=Y1+1
200 IF Y1>Y2 THEN 140 ELSE 160
210 READ X1,X2,Y
220 IF X1=-1 THEN 270
230 FOR Z=X1 TO X2
240 RESET(Z,Y)
250 NEXT Z
260 GOTO 210
270 READ X1,X2,Y
280 IF X1=-1 THEN 340
290 FOR Z=X1 TO X2
300 RESET(Z,Y)
310 NEXT Z
320 Y=Y+1
330 IF Y<=47 THEN 290 ELSE 270
340 SET(53,42)
350 SET(54,43)
360 READ X,Y
370 IF X=-1 THEN 420
380 IF POINT(X,Y) THEN RESET(X,Y) ELSE SET(X,Y)
390 FOR T=1 TO 250
400 NEXT T
410 GOTO 360
420 RESTORE
430 READ DUM
440 IF DUM=-2 THEN 360 ELSE 430
1000 DATA 32,47,41,47,50,57,43,47,60,66,39
1010 DATA 47,69,95,42,47,-1,-1,-1,-1,32,47
1020 DATA 44,69,95,45,-1,-1,-1,39,40,41,86
1030 DATA 87,42,-1,-1,-2,61,7,81,38,74,31
1040 DATA 58,20,63,14,87,29,51,37,94,35,45
1050 DATA 24,51,17,71,12,33,34,58,35,30,37
1060 DATA 80,27,79,20,66,9,56,11,71,36,48
1070 DATA 36,42,32,40,29,69,24,73,17,53,27
1080 DATA 63,29,82,33,98,38,66,9,87,29,61
1090 DATA 7,81,38,74,31,58,20,63,14,87,29
1100 DATA 51,37,94,35,45,24,51,17,71,12,33
1110 DATA 34,58,35,30,37,80,27,79,20,66,9
1120 DATA 56,11,71,36,42,36,48,32,40,29,69
1130 DATA 24,73,17,53,27,63,29,82,33,98,38
1140 DATA 66,9,87,29,63,2,-1,-1

```

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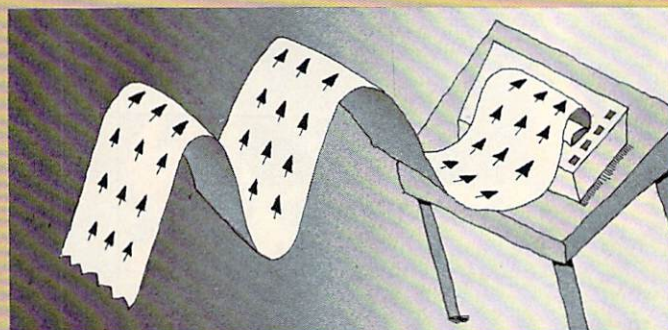
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WRAPPING PAPER

BY JOEY LATIMER



Do you often find yourself still wrapping gifts on Christmas morning? And right when the doorbell rings, announcing the arrival of all your gift-laden relatives, does your wrapping paper supply run out? Do you then run around the house in a state of panic searching for a quick substitute? Well, if you have a computer and a printer, search no more.

Type in this personalized wrapping paper program for a Christmas tree design. You won't even have

to write a card! When you run the program, the computer will ask you for the name of the giver and the name of the recipient and will print this information on the wrapping paper. You can easily modify the program to create your own picture by changing the design in the data statements; no other changes are necessary if your design fits into seven short DATA statements like ours. Afterward, you might want to color the paper in with crayons.

Apple/Wrapping Paper

```

100 HOME
110 PRINT "THIS PROGRAM PRINTS"
120 PRINT "HOLIDAY WRAPPING PAPER."
130 PRINT
140 PRINT "PLEASE PRESS <RETURN> AFTER EACH R
EPLY."
150 PRINT
160 PRINT "WHO IS THE PRESENT FROM;"
170 INPUT FR$
180 PRINT "WHO IS THE PRESENT FOR;"
190 INPUT FO$
200 HOME
210 PRINT "WHEN YOUR PRINTER IS READY,"
220 PRINT "PRESS ANY KEY TO START PRINTING."
230 GET R$
240 IF R$ = "" THEN 230
300 FOR A = 1 TO 8
310 READ T$(A)
350 NEXT A
360 PR# 1
370 FOR P = 1 TO 8
400 PRINT T$(P)T$(P)T$(P)T$(P)T$(P)T$(P)T$(P)
420 NEXT P
450 PRINT TAB(21) "TO " FO$ " HAPPY HOLIDAYS
FROM " FR$
460 PRINT
470 GOTO 370
480 PR# 0
2000 DATA "      +      "
2010 DATA "      ***      "
2020 DATA "      *0***      "
2030 DATA "      ****0**      "
2040 DATA "      *0*****0*      "
2050 DATA "      ****0*****      "
2060 DATA "      I      "
2070 DATA "      "

```

Atari/Wrapping Paper

```

10 DIM T$(117)
20 DIM FR$(15)
30 DIM FO$(15)
40 DIM TMP$(15)
100 PRINT CHR$(125)
110 PRINT "THIS PROGRAM PRINTS"
120 PRINT "HOLIDAY WRAPPING PAPER."
130 PRINT
140 PRINT "PLEASE PRESS <RETURN> AFTER EACH R
EPLY."
150 PRINT
160 PRINT "WHO IS THE PRESENT FROM;"
170 INPUT FR$
180 PRINT "WHO IS THE PRESENT FOR;"
190 INPUT FO$
200 PRINT CHR$(125)
210 PRINT "WHEN YOUR PRINTER IS READY,"
220 PRINT "PRESS ANY KEY TO START PRINTING."
250 OPEN #1,4,0,"K"
260 GET #1,A
270 PRINT "TO STOP PRINTING,"
280 PRINT "PRESS THE SYSTEM RESET KEY."
300 FOR A=1 TO 8
310 READ TMP$
320 TMP$=TMP$(2,14)
330 T$(13*A-11,13*A+1)=TMP$
350 NEXT A
360 OPEN #7,8,0,"P:"
370 FOR P=1 TO 8
380 L=13*P-11
390 R=13*P+1
400 PRINT #7;T$(L,R);T$(L,R);T$(L,R);T$(L,R);
T$(L,R);T$(L,R)
420 NEXT P
450 PRINT #7;CHR$(9);CHR$(9);CHR$(9);"TO ";FO
$;" HAPPY HOLIDAYS FROM ";FR$
460 PRINT #7
470 GOTO 370
2000 DATA "      +      "
2010 DATA "      ***      "
2020 DATA "      *0***      "
2030 DATA "      ****0**      "
2040 DATA "      *0*****0*      "
2050 DATA "      ****0*****      "
2060 DATA "      I      "
2070 DATA "      "

```

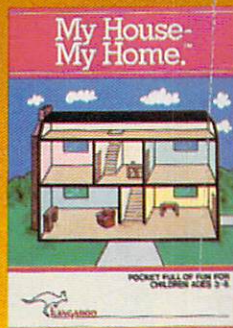

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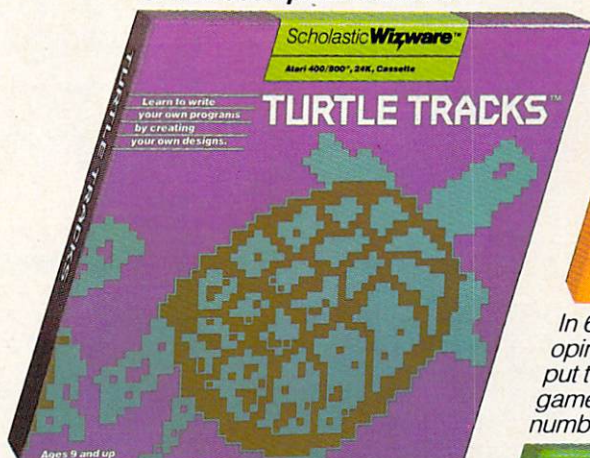
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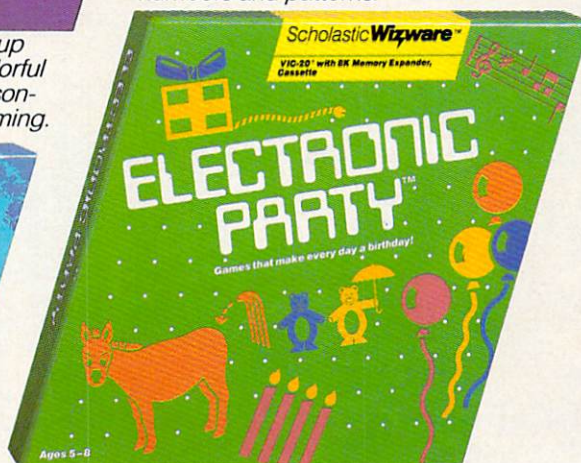
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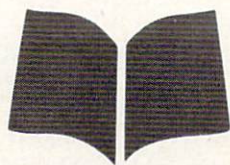


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Scholastic Wizware™

TI-99/4A/Wrapping Paper

```

100 CALL CLEAR
110 PRINT "THIS PROGRAM PRINTS"
120 PRINT "HOLIDAY WRAPPING PAPER."
130 PRINT
140 PRINT "PLEASE PRESS <ENTER> AFTER EACH REPLY."
150 PRINT
160 PRINT "WHO IS THE PRESENT FROM?";
170 INPUT FR$
180 PRINT "WHO IS THE PRESENT FOR?";
190 INPUT FO$
200 CALL CLEAR
210 PRINT "WHEN YOUR PRINTER IS READY,"
220 PRINT "PRESS ANY KEY TO START PRINTING."
230 CALL KEY(0,KEY,STATUS)
240 IF STATUS=0 THEN 230
250 CALL CLEAR
270 PRINT "TO STOP PRINTING, HOLD DOWN ANY KEY."
280 OPEN #1:"PIO"
300 FOR A=1 TO 8
310 READ T$(A)
350 NEXT A
370 FOR P=1 TO 8
400 PRINT #1:T$(P);T$(P);T$(P);T$(P);T$(P);T$(P);T$(P);T$(P)
410 GOSUB 1000
420 NEXT P
450 PRINT #1:TAB(21);"TO ";FO$;" HAPPY HOLIDAYS FROM ";FR$
460 PRINT #1:
470 GOTO 370
1000 CALL KEY(0,KEY,STATUS)
1010 IF STATUS=0 THEN 1030
1020 STOP
1030 RETURN
2000 DATA "      +      "
2010 DATA "      ***      "
2020 DATA "     *O***      "
2030 DATA "    ****O**      "
2040 DATA "   *O*****O*      "
2050 DATA "  *****O*****      "
2060 DATA "      I      "
2070 DATA "      "

```

Timex Sinclair 1000/Wrapping Paper

```

10 DIM T$(8,13)
20 LET T$(1)="      +      "
30 LET T$(2)="      ***      "
40 LET T$(3)="     *O***      "
50 LET T$(4)="    ****O**      "
60 LET T$(5)="   *O*****O*      "
70 LET T$(6)="  *****O*****      "
80 LET T$(7)="      I      "
90 LET T$(8)="      "
110 PRINT "THIS PROGRAM PRINTS"
120 PRINT "HOLIDAY WRAPPING PAPER."
130 PRINT
140 PRINT "PLEASE PRESS <ENTER>","AFTER EACH REPLY."
150 PRINT
160 PRINT "WHO IS THE PRESENT FROM?";
170 INPUT F$
180 PRINT "WHO IS THE PRESENT FOR?";
190 INPUT R$

```

```

200 CLS
210 PRINT "WHEN YOUR PRINTER IS READY,"
220 PRINT "PRESS ANY KEY TO START PRINTING."
270 PRINT ",,.,.,,"TO STOP, PRESS AND HOLD", "THE <S> KEY."
280 IF INKEY$="" THEN GOTO 280
370 FOR P=1 TO 8
400 LPRINT T$(P);T$(P);T$(P);T$(P);T$(P);T$(P);T$(P);T$(P)
410 IF INKEY$="S" THEN STOP
420 NEXT P
450 LPRINT TAB 21;"TO ";R$;" HAPPY HOLIDAYS FROM ";F$
460 LPRINT
470 GOTO 370

```

TRS-80s & IBM PC/Wrapping Paper

```

100 CLS
110 PRINT"THIS PROGRAM PRINTS"
120 PRINT"HOLIDAY WRAPPING PAPER"
130 PRINT
140 PRINT"PLEASE PRESS <ENTER> AFTER EACH REPLY."
150 PRINT
160 PRINT"WHO IS THE PRESENT FROM?";
170 INPUT FR$
180 PRINT"WHO IS THE PRESENT FOR?";
190 INPUT FO$
200 CLS
210 PRINT"WHEN YOUR PRINTER IS READY,"
220 PRINT"PRESS ANY KEY TO START PRINTING."
230 R$=INKEY$
240 IF R$="" THEN 230
300 FOR A = 1 TO 8
310 READ T$(A)
350 NEXT A
370 FOR P = 1 TO 8
400 LPRINT T$(P);T$(P);T$(P);T$(P);T$(P);T$(P);T$(P);T$(P)
420 NEXT
450 LPRINT TAB(21) "TO " FO$ " HAPPY HOLIDAYS FROM " FR$
460 LPRINT
470 GOTO 370
2000 DATA "      +      "
2010 DATA "      ***      "
2020 DATA "     *O***      "
2030 DATA "    ****O**      "
2040 DATA "   *O*****O*      "
2050 DATA "  *****O*****      "
2060 DATA "      I      "
2070 DATA "      "

```

Note: If you have a TRS-80 Color Computer, substitute PRINT #2 for LPRINT in lines 400, 450, and 460.

TIPS TO THE TYPIST

1. When you type program lines into your computer, be sure to copy them *exactly* as written. Numbers, punctuation marks, and spaces are very important!
2. Remember to press RETURN or ENTER *after* every completed program line.
3. Run the program when you finish typing it in by typing RUN and pressing the RETURN or ENTER key. If the computer gives you an error message, don't panic. Mistakes can be fixed. List the program by typing the word LIST and pressing the RETURN or ENTER key and double-check each line. A foolproof way to correct a mistake is to type in the entire line again (including its line number). When you list the program again, you should find the new line in place of the old.
4. If you need more help, read the programming guide written for your computer. It will answer questions that can't possibly be covered here.
5. When all else fails . . . turn off the computer and relax.

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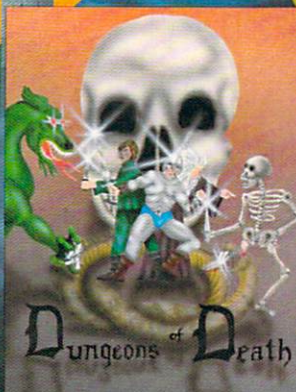
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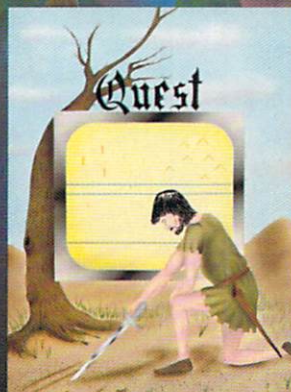


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CHORE ASSIGNER

BY JOEY LATIMER

"What d'ya mea-a-a-n I have to wash the dishes? But Mom, that's not fair!" Is this a familiar cry every time you assign a task to one of your kids? Then *Chore Assigner* is just the program for you!

Let your computer delegate responsibilities, with a random name selection. Not only will your computer remain impervious to the anguished cries afterwards, but it will make the task assignment process seem like fun! Watch your children hold their breath as their names flash on and off the screen while the computer decides.

To use *Chore Assigner*, type in a task and the names of all the possible candidates. After the computer selects a person, his or her name will disappear from the list, and the rest of the names will be available for a new chore. Or you can start all over



again, with a different group of people. This program is ideal for the endless variety of chores that arise at holiday time.

Apple/Chore Assigner

```
40 HOME
50 PRINT "THE CHORE ASSIGNER"
60 PRINT
70 PRINT "TYPE THE NUMBER OF PEOPLE AVAILABLE"
80 PRINT "FOR DOING CHORES; THEN PRESS <RETURN>."
90 INPUT P
100 B = P
110 DIM N$(P)
150 HOME
160 PRINT "TYPE THE NAMES, ONE AT A TIME."
170 PRINT "PRESS <RETURN> AFTER EACH NAME."
180 FOR N = 1 TO P
190 INPUT N$(N)
210 NEXT N
220 HOME
230 PRINT "TYPE A CHORE THAT NEEDS TO BE DONE"
240 PRINT "THEN PRESS <RETURN>."
250 INPUT CH$
260 HOME
270 PRINT "PRESS <RETURN> AND THE"
280 PRINT "COMPUTER WILL PICK A PERSON"
290 PRINT "AT RANDOM TO COMPLETE THE CHORE."
310 GET R$
320 IF R$ <> CHR$(13) THEN 310
330 HOME
340 PRINT "THINKING....."
350 FOR T = 1 TO 600
360 NEXT T
370 FOR X = 1 TO INT(RND(1) * 150) + 50
380 R = INT(RND(1) * P) + 1
390 IF N$(R) = "" THEN 450
400 HOME
410 PRINT
420 PRINT TAB(18) N$(R)
```

```
430 FOR T = 1 TO 40
440 NEXT T
450 NEXT X
460 IF N$(R) = "" THEN 370
470 HOME
480 PRINT N$(R); " HAS BEEN PICKED TO"
490 PRINT CH$
500 N$(R) = ""
510 PRINT
520 B = B-1
530 FOR X = 1 TO P
540 IF N$(X) = "" THEN 560
550 PRINT N$(X)
560 NEXT X
570 IF B = 1 THEN 690
580 PRINT "ARE STILL AVAILABLE FOR CHORES."
590 PRINT
600 PRINT "DO YOU WANT TO"
610 PRINT "1) ASSIGN A NEW CHORE"
620 PRINT "2) QUIT"
630 PRINT
640 PRINT "TYPE A NUMBER:"
650 PRINT "THEN PRESS <RETURN>."
660 INPUT N
670 ON N GOTO 220,700
690 PRINT "LUCKED OUT!"
700 END
```

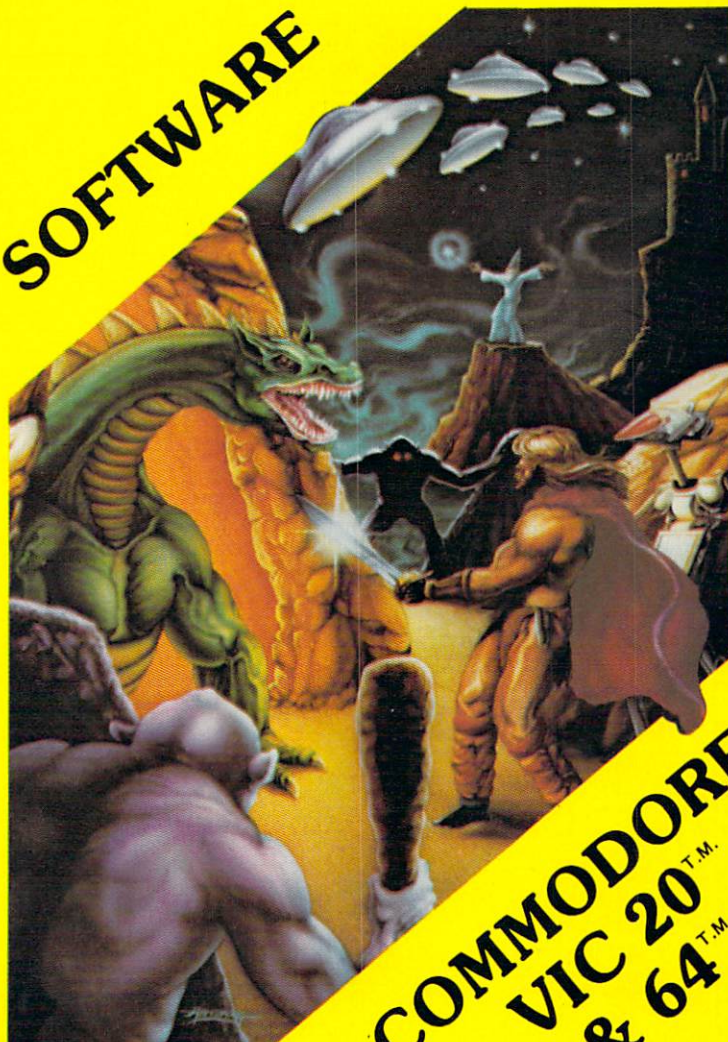
Atari/Chore Assigner

```
10 DIM CH$(40)
20 DIM N$(10)
40 PRINT CHR$(125)
50 PRINT "THE CHORE ASSIGNER"
60 PRINT
70 PRINT "TYPE THE NUMBER OF PEOPLE AVAILABLE"
80 PRINT "FOR DOING CHORES; THEN PRESS <RETURN>."
90 INPUT P
100 B=P
110 DIM N$(10*P)
120 FOR I=1 TO 10*P
130 N$(I,1)=" "
140 NEXT I
150 PRINT CHR$(125)
160 PRINT "TYPE THE NAMES, ONE AT A TIME."
170 PRINT "PRESS <RETURN> AFTER EACH NAME."
180 FOR N=1 TO P
190 INPUT NA$
200 N$(10*N-9,10*N)=NA$
210 NEXT N
220 PRINT CHR$(125)
230 PRINT "TYPE A CHORE THAT NEEDS TO BE DONE"
240 PRINT "THEN PRESS <RETURN>."
250 INPUT CH$
260 PRINT CHR$(125)
270 PRINT "PRESS <RETURN> AND THE"
280 PRINT "COMPUTER WILL PICK A PERSON"
290 PRINT "AT RANDOM TO COMPLETE THE CHORE."
300 OPEN #1,4,0,"K"
310 GET #1,A
320 CLOSE #1
330 PRINT CHR$(125)
340 PRINT "THINKING....."
350 FOR T=1 TO 600
360 NEXT T
370 FOR X=1 TO INT(RND(0)*100)+50
380 R=INT(RND(0)*P)+1
390 IF N$(10*R-9,10*R-9)=" " THEN 450
400 PRINT CHR$(125)
410 PRINT
420 PRINT " ";N$(10*R-9,10*R)
430 FOR T=1 TO 40
440 NEXT T
450 NEXT X
460 IF N$(10*R-9,10*R-9)=" " THEN 370
```




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HOLIDAY PROGRAMS

```

470 PRINT CHR$(125)
480 PRINT N$(10*R-9,10*R); " HAS BEEN PICKED TO "
490 PRINT CH$
500 N$(10*R-9,10*R-9)=" "
510 PRINT
520 B=B-1
530 FOR X=1 TO P
540 IF N$(10*X-9,10*X-9)=" " THEN 560
550 PRINT N$(10*X-9,10*X)
560 NEXT X
570 IF B=1 THEN 690
580 PRINT "ARE STILL AVAILABLE FOR CHORES."
590 PRINT
600 PRINT "DO YOU WANT TO"
610 PRINT "1) ASSIGN A NEW CHORE"
620 PRINT "2) QUIT"
630 PRINT
640 PRINT "TYPE A NUMBER;"
650 PRINT "THEN PRESS <RETURN>."
660 INPUT N
670 ON N GOTO 220,700
690 PRINT "LUCKED OUT!"
700 END

```

Commodore 64 & VIC-20/Chore Assigner

```

40 PRINT CHR$(147)
50 PRINT "THE CHORE ASSIGNER"
60 PRINT
70 PRINT "TYPE THE NO. OF PEOPLE AVAILABLE"
80 PRINT "FOR DOING CHORES: THEN PRESS <RETURN>."
90 INPUT P
100 B=P
110 DIM N$(P)
150 PRINT CHR$(147)
160 PRINT "TYPE THE NAMES, ONE AT A TIME."
170 PRINT "PRESS <RETURN> AFTER EACH NAME."
180 FOR N=1 TO P
190 INPUT N$(N)
210 NEXT N
220 PRINT CHR$(147)
230 PRINT TAB(4) "TYPE A CHORE THAT NEEDS TO BE DONE:"
240 PRINT "THEN PRESS <RETURN>."
250 INPUT CH$
260 PRINT CHR$(147)
270 PRINT "PRESS <RETURN> AND THE"
280 PRINT "COMPUTER WILL PICK A PERSON.":
290 PRINT "AT RANDOM, TO COMPLETE THE CHORE."
310 GET R$
320 IF R$<>CHR$(13) THEN 310
330 PRINT CHR$(147)
340 PRINT "THINKING....."
350 FOR T=1 TO 600
360 NEXT T
370 FOR X=1 TO INT(RND(1)*150)+50
380 R=INT(RND(1)*P)+1
390 IF N$(R)="" THEN 450
400 PRINT CHR$(147)
410 PRINT
420 PRINT TAB(8) N$(R)
430 FOR T=1 TO 40
440 NEXT T
450 NEXT X
460 IF N$(R)="" THEN 370
470 PRINT CHR$(147)
480 PRINT N$(R); " HAS BEEN PICKED TO "
490 PRINT CH$
500 N$(R)=""
510 PRINT
520 B=B-1
530 FOR X=1 TO P
540 IF N$(X)="" THEN 560
550 PRINT N$(X)
560 NEXT X
570 IF B=1 THEN 690
580 PRINT "ARE STILL AVAILABLE."
590 PRINT
600 PRINT "DO YOU WANT TO"
610 PRINT "1) ASSIGN ANOTHER CHORE"
620 PRINT "2) QUIT"
630 PRINT
640 PRINT "TYPE A NUMBER;"
650 PRINT "THEN PRESS <ENTER>."
660 INPUT N
670 ON N GOTO 220,700
690 PRINT "LUCKED OUT!"
700 END

```

```

580 PRINT "ARE STILL AVAILABLE."
590 PRINT
600 PRINT "DO YOU WANT TO"
610 PRINT "1) ASSIGN A NEW CHORE"
620 PRINT "2) QUIT"
630 PRINT
640 PRINT "TYPE A NUMBER;"
650 PRINT "THEN PRESS <RETURN>."
660 INPUT N
670 ON N GOTO 220,700
690 PRINT "LUCKED OUT!"
700 END

```

TI-99/4A/Chore Assigner

```

30 RANDOMIZE
40 CALL CLEAR
50 PRINT "THE CHORE ASSIGNER"
60 PRINT
70 PRINT "TYPE THE NUMBER OF PEOPLE": "AVAILABLE FOR DOING CHORES;"
80 PRINT "THEN PRESS <ENTER>."
90 INPUT P
100 B=P
110 DIM N$(20)
140 CALL CLEAR
150 PRINT "TYPE THE NAMES, ONE AT A TIME. P"
160 PRINT "PRESS <ENTER> AFTER"
170 PRINT "EACH NAME."
180 FOR N=1 TO P
190 INPUT N$(N)
210 NEXT N
220 CALL CLEAR
230 PRINT "TYPE A CHORE THAT NEEDS TO"
240 PRINT "BE DONE; THEN PRESS <ENTER>."
250 INPUT CH$
260 CALL CLEAR
270 PRINT "PRESS <ENTER> AND THE"
280 PRINT "COMPUTER WILL PICK A PERSON"
290 PRINT "AT RANDOM TO DO THE CHORE."
310 INPUT R$
330 CALL CLEAR
340 PRINT "THINKING...."
350 FOR T=1 TO 200
360 NEXT T
370 FOR X=1 TO INT(10*RND)+20
380 R=INT(P*RND)+1
390 IF N$(R)="" THEN 450
400 CALL CLEAR
410 PRINT
420 PRINT " "; N$(R)
430 FOR T=1 TO 50
440 NEXT T
450 NEXT X
460 IF N$(R)="" THEN 370
470 CALL CLEAR
480 PRINT N$(R); " HAS BEEN PICKED TO "
490 PRINT CH$
500 N$(R)=""
510 PRINT
520 B=B-1
530 FOR X=1 TO P
540 IF N$(X)="" THEN 560
550 PRINT N$(X)
560 NEXT X
570 IF B=1 THEN 690
580 PRINT "ARE STILL AVAILABLE."
590 PRINT
600 PRINT "DO YOU WANT TO"
610 PRINT "1) ASSIGN ANOTHER CHORE"
620 PRINT "2) QUIT"
630 PRINT
640 PRINT "TYPE A NUMBER;"
650 PRINT "THEN PRESS <ENTER>."
660 INPUT N
670 ON N GOTO 220,700
690 PRINT "LUCKED OUT!"
700 END

```


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HOLIDAY PROGRAMS

Timex Sinclair 1000 w/ 16K RAM Pack/Chore Assigner

```

30 RAND
40 CLS
50 PRINT "THE CHORE ASSIGNER"
60 PRINT
70 PRINT "TYPE THE NUMBER OF PEOPLE", "AVAIL
ABLE FOR DOING CHORES:"
80 PRINT "THEN PRESS <ENTER>."
90 INPUT P
100 LET B=P
110 DIM N$(P,16)
140 CLS
160 PRINT "TYPE THE NAMES ONE AT A TIME."
170 PRINT "PRESS <ENTER> AFTER EACH NAME."
180 FOR N=1 TO P
190 INPUT N$(N)
210 NEXT N
220 CLS
230 PRINT "TYPE A CHORE THAT", "NEEDS TO BE D
ONE;"
240 PRINT "THEN PRESS <ENTER>."
250 INPUT C$
260 CLS
270 PRINT "PRESS <ENTER> AND THE"
280 PRINT "COMPUTER WILL PICK A PERSON"
290 PRINT "AT RANDOM TO COMPLETE THE CHORE."
320 IF INKEY$="" THEN GOTO 320
330 CLS
340 PRINT "THINKING....."
350 PAUSE 180
370 FOR X=1 TO INT (RND*15)+5
380 LET R=INT (RND*P)+1
390 IF N$(R, TO 1)=" " THEN GOTO 450
400 CLS
410 PRINT
420 PRINT AT 1,13;N$(R)
450 NEXT X
460 IF N$(R, TO 1)=" " THEN GOTO 370

```

```

470 CLS
480 PRINT N$(R), "HAS BEEN PICKED TO"
490 PRINT C$
500 LET N$(R)=" "
510 PRINT
520 LET B=B-1
530 FOR X=1 TO P
540 IF N$(X, TO 1)=" " THEN GOTO 560
550 PRINT N$(X)
560 NEXT X
570 IF B=1 THEN GOTO 690
580 PRINT "ARE STILL AVAILABLE FOR CHORES."
590 PRINT
600 PRINT "DO YOU WANT TO"
610 PRINT "1) ASSIGN A NEW CHORE"
620 PRINT "2) QUIT"
630 PRINT
640 PRINT "TYPE A NUMBER;"
650 PRINT "THEN PRESS <ENTER>."
660 INPUT N
670 IF N=1 THEN GOTO 220
680 IF N=2 THEN STOP
690 PRINT "LUCKED OUT."
700 STOP

```

TRS-80s & IBM PC/Chore Assigner

```

40 CLEAR 1000:CLS
50 PRINT "THE CHORE ASSIGNER"
60 PRINT
70 PRINT "TYPE THE NUMBER OF PEOPLE AVAILABLE
"
80 PRINT "FOR DOING CHORES: THEN PRESS <ENTER>
>."
90 INPUT P
100 B=P
110 DIM N$(P)
140 CLS
150 PRINT "TYPE THE NAMES. ONE AT A TIME."

```

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```

160 PRINT "PRESS <ENTER> AFTER EACH NAME."
170 FOR N=1 TO P
180 INPUT N$(N)
210 NEXT N
220 CLS
230 PRINT "TYPE A CHORE THAT NEEDS TO BE"
240 PRINT "DONE; THEN PRESS <ENTER>."
250 INPUT CH$
260 CLS
270 PRINT "PRESS <ENTER> AND THE COMPUTER"
280 PRINT "WILL PICK A PERSON TO COMPLETE"
290 PRINT "THE CHORE."
310 R$=INKEY$
320 IF R$="" THEN 310
330 CLS
340 PRINT "THINKING....."
350 FOR T=1 TO 1000
360 NEXT T
370 FOR X=1 TO RND(150)+50
380 R=RND(P)
390 IF N$(R)="" THEN 450
400 CLS
410 PRINT
420 PRINT TAB(13) N$(R)
430 FOR T=1 TO 50
440 NEXT T
450 NEXT X
460 IF N$(R)="" THEN 370
470 CLS
480 PRINT N$(R); " HAS BEEN PICKED TO"
490 PRINT CH$
500 N$(R)=""
510 PRINT
520 B=B-1
530 FOR X=1 TO P
540 IF N$(X)="" THEN 560
550 PRINT N$(X)
560 NEXT X

```

```

570 IF B=1 THEN 690
580 PRINT "ARE STILL AVAILABLE FOR CHORES."
590 PRINT
600 PRINT "DO YOU WANT TO"
610 PRINT "1) ASSIGN ANOTHER CHORE"
620 PRINT "2) QUIT"
630 PRINT
640 PRINT "TYPE A NUMBER;"
650 PRINT "THEN PRESS <ENTER>."
660 INPUT N
670 ON N GOTO 220,700
690 PRINT "LUCKED OUT!"
700 END

```

Note: If you have an IBM PC, change line 40 to read CLS, line 370 to read FOR X=1 TO RND*150 + 50, and line 380 to read R=RND*P+1.

CORRECTIONS

All the line numbers in the modification box for the *Trick or Treat* program (October issue, p. 70) should have been 10 higher. For example, "in lines 10, 90, 150, ..." should have read "in lines 20, 100, 160, ..." We are sorry for any difficulties this may have caused you.

Also, the listing given for the *Auto-Nag* program (November issue, pp. 124-127) was the IBM PC version; it was mislabeled as the TRS-80 version due to a printer error. To make the program run on the TRS-80 Models III and 4, simply make the changes shown at the end of the program under "Modifications for Other Computers."

TRS-80 Color Computer owners can use the Model III/4 version if they add two additional lines:

```

125 IF N = 0 THEN 135
135 IF E = 0 THEN CLOSE #1:GOTO 160

```

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ONE IN A MILLION

Can you find your mother in a crowded department store?

BY JONATHAN FRANKLIN

It's the 23rd of December and the big department store in Sodaville, USA, is crowded with last-minute shoppers. You've bought your mother's gift and now want to rejoin her so that you can get home in time for your favorite TV show. The question is: Where is she? Your only clues are the people on her shopping list.

One is your father, who often returns gifts because of his very traditional tastes.

Also on your mother's list is your grandmother. Your mother has inherited her mother's love of cooking (especially preparing the old family recipe for chocolate cake). But, alas, old family recipes are about all that your grandmother has passed down to the next generation. She still retains all of the old family china.

Your mother is also looking for a gift for her best friend's daughter, who is going to be married in three days and then fly off for a wonderful sun-filled, two-week honeymoon in Hawaii. Your mother hasn't seen the bride (who now resides out of state) in nearly three years. The fanciest hotel in Sodaville has been rented for a prewedding ball tonight, and your mother is not only excited about seeing the bride again, but also because she hasn't attended such an event in years.

You don't feel like setting out on a wild goose chase through the store in search of your mother. First of all, it would be nearly impossible to spot her in the crowd. With her black winter coat, she's dressed like many other shoppers in the store. So you decide that your best recourse is to go to the departments where your mother might be shopping and ask the salesclerks there if they have seen her.

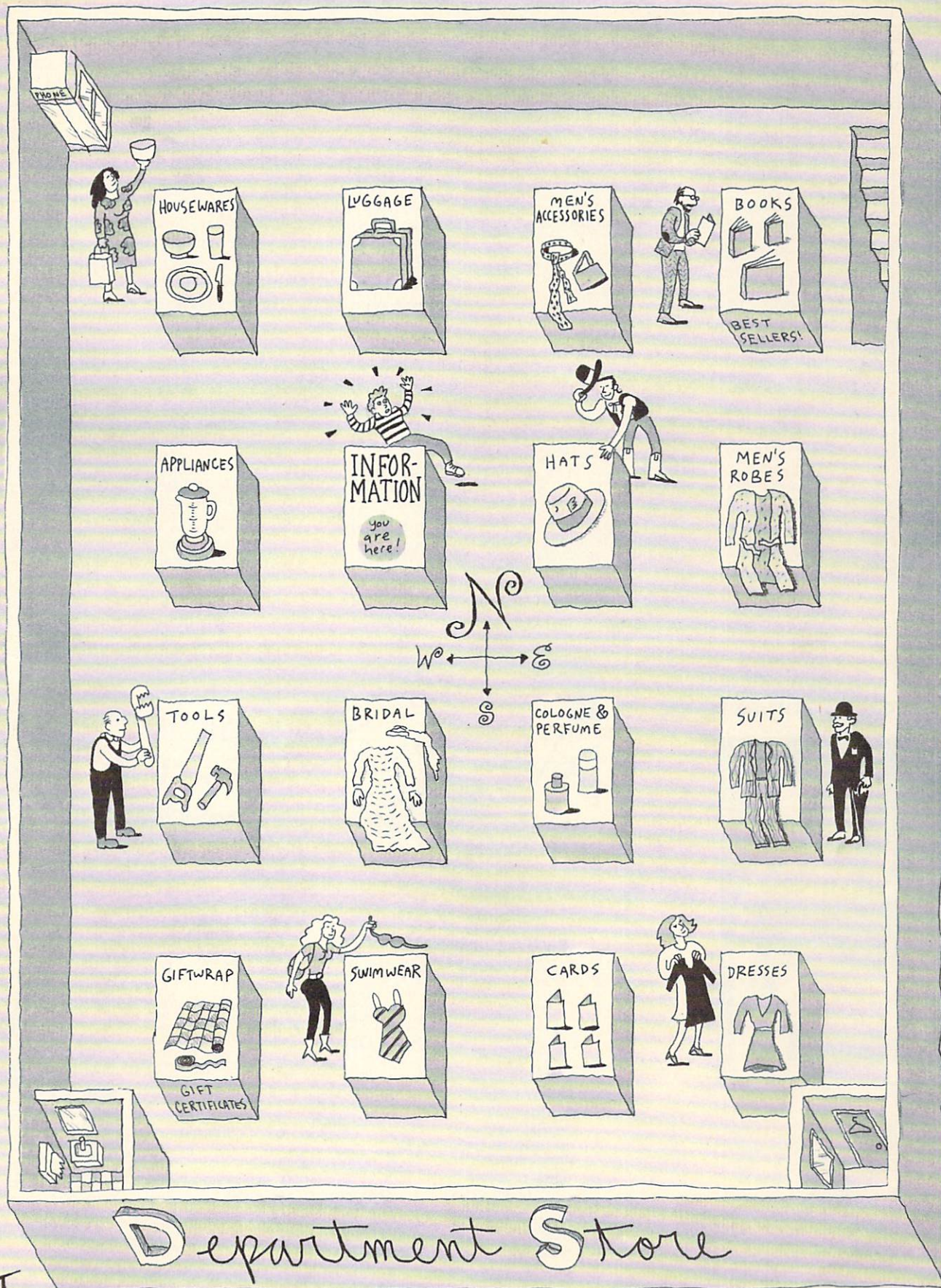
When you run *Shopper Search* you will find yourself at the information booth, where there are two salesclerks on duty. To converse with them (as with every salesclerk in the store), type "T" for talk, and press the RETURN or ENTER key. (Be sure to set your computer for all uppercase letters before running the program.) Then input the clerk's name exactly as given. (Other names will be provided by salesclerks as you move through the store.) But remember: It is easy for a salesclerk to confuse the description of your mother with another shopper. Salesclerks may unintentionally mislead you.

To move from one department in the store to another, type "N" (for north), "S" (south), "W" (west), or "E" (east), pressing the RETURN or ENTER key after each move. You should be able to locate your mother in relatively few moves. If you find yourself going around in circles, it may be a sign that you have listened to the wrong salesclerk along the way. You might then want to type "Q" (for quit) and run the program again.

Base Version (Apple)/Shopper Search

```
10 DIM ST$(4,4,3),WH(4,4,4),HN$(11),HL(8)
20 HOME:X = 2:Y = 2:PRINT "READY IN A MOMENT
..."
30 FOR I = 1 TO 8:READ HN$(I):NEXT I
40 CT = 5:IN = 8:FOR I = 9 TO 11:12 = 18
50 HN$(I) = HN$(I) + MID$(HN$(IN),CT,1)
60 CT = CT - 3:IF CT < 1 THEN CT = CT + 7:IN
= IN - 1:IF IN = 0 THEN IN = 8:CT = CT - 3
70 12 = 12 - 1:IF 12 = 0 THEN 90
80 GOTO 50
90 NEXT I
100 FOR A = 1 TO 8:READ HN$(A),HL(A):NEXT A
110 FOR A = 1 TO 4:FOR B = 1 TO 4:READ ST$(B,
A,1)
120 FOR C = 2 TO 3:READ ST$(A,B,C):NEXT C
130 FOR C = 1 TO 4:READ WH(A,B,C):NEXT C
140 NEXT B:NEXT A
150 HOME
160 A$ = "YOU ARE IN THE " + ST$(X,Y,1) + " DE
PARTMENT.":GOSUB 1000
170 IF X <> 2 OR Y <> 2 THEN 190
180 A$ = "YOU CAN TALK TO EITHER MRS. HABERSH
AM OR MS. ROSS, OR BOTH.":GOSUB 1000
190 A$ = "DO YOU WANT TO GO N(ORTH), S(OUTH),
E(AST), OR W(EST): T(TALK): OR Q(UIT)?"
200 GOSUB 1000
210 INPUT K$:HOME
220 IF K$ = "N" THEN Y = Y - 1
230 IF K$ = "S" THEN Y = Y + 1
240 IF K$ = "E" THEN X = X + 1
250 IF K$ = "W" THEN X = X - 1
260 IF K$ = "T" THEN 350
270 IF K$ = "Q" THEN END
280 IF X < 1 THEN X = 1:GOTO 330
290 IF X > 4 THEN X = 4:GOTO 330
300 IF Y < 1 THEN Y = 1:GOTO 330
310 IF Y > 4 THEN Y = 4:GOTO 330
320 GOTO 150
330 HOME
340 A$ = "YOU ARE STILL IN THE " + ST$(X,Y,1)
+ " DEPARTMENT.":GOSUB 1000:GOTO 170
350 A$ = "TO WHOM WOULD YOU LIKE TO TALK?":GOS
SUB 1000:INPUT N$:PRINT
360 MK = 0:FOR I = 1 TO 8:IF LEFT$(N$,HL(I))
= HN$(I) THEN MK = 1
370 NEXT I:IF MK <> 0 THEN N$ = RIGHT$(N$, LE
N(N$) - HL(MK))
380 IF LEFT$(N$,1) = " " THEN N$ = RIGHT$(N$,
LEN(N$) - 1)
390 MR = 0:FOR I = 2 TO 3:IF ST$(X,Y,I) = N$
THEN MR = 1
400 NEXT I:IF MR * MK <> 0 THEN MK = INT((MK
+ 1) / 2) * 2:IF MK <> WH(X,Y,MR + 1) THEN MR
= 0
410 IF MR = 0 THEN A$ = "SORRY, THERE'S NO ON
E HERE BY THAT NAME."
420 IF MR = 0 THEN GOSUB 1000:GOSUB 2000:GOTO
150
430 A$ = "HI. MY NAME IS " + HN$(WH(X,Y,MR +
1)) + " " + ST$(X,Y,MR) + ". "
440 IF X + 6 * Y + MR = 31 THEN 520
450 A$ = A$ + "A WOMAN WHO FITS THAT DESCRIPT
ION JUST "
460 IF X * X - 2 * Y = 2 OR ABS(X - Y) = 3 TH
EN A$ = A$ + "BOUGHT SOMETHING HERE AND THEN
"
470 A$ = A$ + "ASKED ME FOR DIRECTIONS TO THE
"
480 WK = WH(X,Y,MR - 1):X1 = INT((WK + 3) / 4
):Y1 = WK - 4 * X1 + 4
490 A$ = A$ + ST$(X1,Y1,1) + " DEPARTMENT. T
ALK TO " + HN$(WH(X1,Y1,3)) + " "
500 A$ = A$ + ST$(X1,Y1,2) + " OR " + HN$(WH(
X1,Y1,4)) + " " + ST$(X1,Y1,3) + " THERE."
510 GOSUB 1000:GOSUB 2000:GOTO 150
520 A$ = A$ + "YES, I HAVE SEEN YOUR MOTHER!"
```

JONATHAN FRANKLIN is a senior at Phillips Exeter Academy in New Hampshire. When he loses his mother in a department store, he knows exactly where to find her: in books. "And she knows that she can always find me in stereos or computers!"



PUZZLE

```

SHE IS IN " + LEFT$(HN$(9),17)
530 A$ = A$ + ". DO YOU WANT TO TALK TO HER?
(Y/N)":GOSUB 1000:INPUT K$
540 IF LEFT$(K$,1) <> "Y" THEN 150
550 HOME
560 A$ = "HELLO DARLING! GUESS WHAT I JUST BO
UGHT. FOR THE BRIDE, THIS MARVELOUS "
570 A$ = A$ + ST$(2,1,1)
580 A$ = A$ + ": THIS SPECIAL " + MID$(HN$(10
),2,16) + " FOR YOUR FATHER; AND SOME "
590 A$ = A$ + LEFT$(HN$(11),4) + ST$(4,1,1)
600 A$ = A$ + " FOR YOUR GRANDMOTHER. AND I'
M ALSO GOING TO GET ONE OF THESE "
610 A$ = A$ + RIGHT$(HN$(11),14)
620 A$ = A$ + ".":GOSUB 1000
630 A$ = "DO YOU WANT TO GO HOME AND WATCH TV
NOW?":GOSUB 1000
640 END
1000 IF LEN(A$) < 40 THEN 1060
1010 FOR I = 1 TO 39
1020 IF ASC(MID$(A$,I,1)) = 32 THEN J = I
1030 NEXT I
1040 PRINT LEFT$(A$,J - 1)
1050 A$ = RIGHT$(A$, LEN(A$) - J):GOTO 1000
1060 PRINT A$:PRINT:RETURN
2000 PRINT:A$ = "PRESS <RETURN> TO CONTINUE .
..":GOSUB 1000
2010 INPUT K$:RETURN
3000 DATA SRWNEMW, TQOAGC, R I LFG, LINATIB,
RS ESOC, EW RTTD, KF DIED, GHGET
3010 DATA MS,2,MS,,3,MISS,4,MISS,4
3020 DATA MR,2,MR,,3,MRS,3,MRS,,4
3030 DATA HOUSEWARES, TYSO,60DDWILL,15,2,8,8
3040 DATA LUGGAGE,CRACKNELL,PIERCE,15,7,8,6
3050 DATA MEN'S ACCESSORIES,BELCHER,MARTIN
3060 DATA 10,12,6,6,BOOKS,KENSINGTON,BRYFOGLE
3070 DATA 7,5,8,2,APPLIANCES,FASCAL,DOSWELL
3080 DATA 12,16,6,6,INFORMATION,HABERSHAM
3090 DATA ROSS,13,1,8,2,HATS,DELLA,FITZGERALD

```

```

3100 DATA 14,3,4,8,MEN'S ROBES,LESSING,NEWMAN
3110 DATA 11,2,2,4,TOOLS,RANDELL,ZOG,8,11,6,6
3120 DATA BRIDAL,FARRAGUT,SINGER,12,9,6,6
3130 DATA COLOGNE & PERFUME,EBERHARDT
3140 DATA DILLON,2,1,8,6,SUITS,NOLAN,THOMPSON
3150 DATA 9,8,8,6,GIFTWRAP,APPLEBAUM,LUTZ
3160 DATA 4,15,6,8,SWIMWEAR,GLOVER,WALKER
3170 DATA 3,10,6,6,CARDS,JEFFERSON,MITCHELL
3180 DATA 7,14,6,6,DRESSES,MULDOON,STERMER
3190 DATA 3,0,2,8

```

MODIFICATIONS FOR OTHER COMPUTERS

Atari/Shopper Search

Because the Atari does not allow string arrays, the Atari version of this program is very different from the base version. If you would like a free translation of this program for the Atari, send a self-addressed, stamped envelope to Karen Cohen, "Atari Shopper Search," FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

Commodore 64 & VIC-20/Shopper Search

Use the base version, except change HOME in lines 20, 150, 210, 330, and 550 to PRINT CHR\$(147) and, if you have a VIC-20, change 40 in line 1000 and 39 in line 1010 to 22 and 21, respectively.

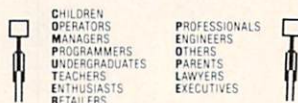
TI-99/4A w/TI Extended BASIC/Shopper Search

Use the base version, with the following changes. First, use a double colon (":") instead of a single colon to separate multiple statements on a single numbered program line. So, for example, you would change line 30 to read 30 FOR I = 1 TO 8 :: READ HN\$(I) :: NEXT I. Second, change HOME in lines 20, 150, 210, 330, and 550 to CALL CLEAR. Third, change 40 in line 1000 and 39 in line 1010 to 28 and 27, respectively. Fourth, change the plus signs in lines 50, 160, 340, 450-470, 490, 500, 530, 560-580, 600, and 620 to ampersands. Fifth, change MID\$ to SEG\$ in lines 50, 580, and 1020.

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Finally, change lines 360-380, 430, 520, 540, 590, 610, 1040, 1050, and 2000 to read

```
360 MK=0 :: FOR I=1 TO 8 :: IF SEG$(N$,1,HL(I))=HN$(I) THEN MK=I
370 NEXT I :: IF MK<>0 THEN N$ = SEG$(N$,HL(MK)+1,LEN(N$))
380 IF SEG$(N$,1,1) = " " THEN N$ = SEG$(N$,2,LEN(N$))
430 A$="HI, MY NAME IS "&HN$(WH(X,Y,MR+1))&"
    "&ST$(X,Y,MR)2", "
520 A$=A$&"YES, I HAVE SEEN YOUR MOTHER! SHE IS IN "&SEG$(HN$(9),1,17)
540 IF SEG$(K$,1,1) <> "Y" THEN 150
590 A$=A$&SEG$(HN$(11),1,4)&ST$(4,1,1)
610 A$=A$&SEG$(HN$(11),5,14)
1040 PRINT SEG$(A$,1,J-1)
1050 A$=SEG$(A$,J+1,LEN(A$)) :: GOTO 1000
2000 PRINT :: A$="PRESS <ENTER> TO CONTINUE .." :: GOSUB 1000
```

TRS-80s & IBM PC/Shopper Search

Use the base version, except change HOME in lines 20, 150, 210, 330, and 550 to CLS and change line 2000 to read

```
2000 PRINT:A$ = "PRESS <ENTER> TO CONTINUE .." :: GOSUB 1000:INPUT K$:RETURN
```

Unless you have an IBM PC, you must also change line 10 to read

```
10 CLEAR 1000:DIM ST$(4,4,3),WH(4,4,4),HN$(11),HL(8)
```

Finally, change 40 in line 1000 and 39 in line 1010 to 64 and 63, respectively, for the Models I and III; 80 and 79, respectively, for the Model 4 and IBM PC; and 32 and 31, respectively, for the Color Computer.

CORRECTION

The TI Extended BASIC version of *Dracula's Family Tree* (October issue, pp. 76-77) will not run correctly unless you change lines 420 and 620 to read

```
420 A$=N$&"LIKED TO DRESS "&C$(C(3))&". HE HAD "
620 IF ASC(SEG$(A$,I,1))<>32 THEN J=I
```

To make the program run in regular TI BASIC, first make the changes to the base version specified on page 77 of the October issue. Then change lines 210, 620, 780-810, 840, and 860 to read as follows:

```
210 IF N$<>B$(I) THEN 230
620 IF ASC(SEG$(A$,I,1))<>32 THEN 640
780 PRINT
790 PRINT " (PRESS THE ENTER"
800 PRINT " KEY TO GO ON)"
810 INPUT I$
840 PRINT "YOU HAVE FOUND": "DRACULA'S FATHER.. IT"
```

```
860 IF I<=6 THEN 890
```

Finally, add lines 220, 630, and 870:

```
220 W=I
630 J=I
870 I=6
```

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CRYPTIC CORRESPONDENCE

HN JAINSCHIGG

years ago, at Co-University in New York, I had the mixed pleasure to meet, and be- friends with, a man named Bob Coyne. Bob was a renaissance man: a poet, philosopher, mathematician. I was a practical "Jack of All Trades" myself, and we dis- covered in one another a kind of sort of friends, and I say, best ene- mies depending our college years in a perennial rivalry that consumed us with sleepless nights. "Nyahh nyaah!" I can't say the Get-Address in Aramaic, but, brother!" Our conversation sustained us in a naive belief that, as we were living in the mind.

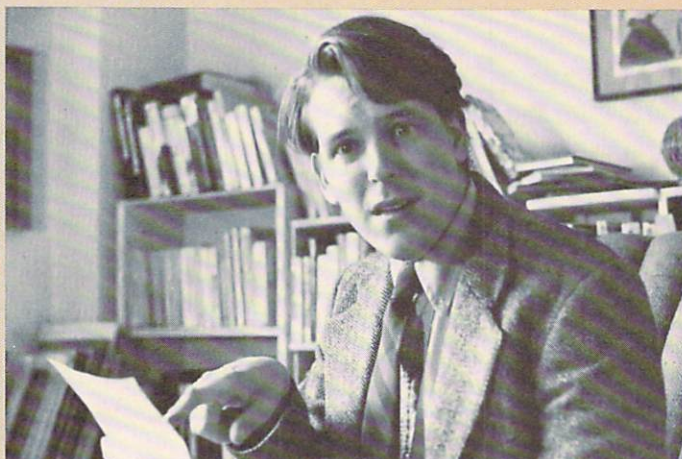
IN TOUCH

Bob's monthly letter in my box. I wondered what he could have up his sleeve this time. Bob had been in rare form lately. His previous letter had been mostly diagrams, describing his involvement in a fictitious science, but the blueprints and the equations were very impressive. I had barely countered that one when here, in an innocent-enough plain white envelope, was his reply.

TYPICAL BOB

I opened it. My jaw dropped. And dropped. Sure enough. Typical Bob. It was a photograph of a computer screen. I looked closer at the writing, and my jaw dropped again—that extra quarter-inch that makes for a really nasty pain in the neck. Bob had designed his own character set! For each letter in the alphabet Bob

stituted a tiny symbol of his own. For instance, the "A" or so I gathered salutation, looked always horseshoe. Well, he had a million's worth of com- work with. Grim- eyed my tiny Atari 800 comput- 3K and disk, Ep- 0 printer with OM. My course my object fixed: write a program to aracter sets, and, ad to figure out se them with my Could I do it? ne the Atari tech- nence and user's Out went the nbling, from the room. e an already long rter than it might it. A month later I a letter into my mailbox. It was a sy letter "... ere fine, work go- only it was writ- rtian. I'm still or his reply.



John Jainschigg contemplating his latest missive from Bob Coyne

SO YOU WANT TO CREATE YOUR OWN CHARACTERS

You can use the first of my programs (*Custom Writer: Design*) to design any kind of characters you want. For example, you can create your own code by devising special symbols for each letter, number, and punctuation mark. You can substitute flowing script characters that resemble handwriting for those standard, block-type letters. You can add diacritical marks (such as French accents or German umlauts) to your computer's repertoire. You can teach your Atari a non-Roman alphabet, such as Greek, Hebrew, or Sanskrit. And let me tell you, until you've written a BASIC program in hieroglyphics, you haven't lived.

Once you've created your new typeface and stored it on disk or tape, you can then run the *Custom Writer: Print* program to give your BASIC programs the ability to print characters from your new character set on your Epson printer. (I've included a simple BASIC program, *Custom Writer: Electronic Typewriter*, as an example of what you can do.) Or you can run the *Custom Writer: Display* program to temporarily substitute your new characters for the standard Atari typeface on your screen.

HOW CUSTOM WRITER: DESIGN WORKS

The Atari character set consists of 128 characters, which may be displayed in either normal (light on dark) or inverse (dark on light) format. Inside the computer, the characters are represented by their character codes—numbers ranging from 0 to 255 representing the 128 standard characters plus their inverses.

For display purposes, the computer must convert these numbers to images on the screen. It does so by referring to a table stored in its permanent memory that contains graphic maps—essentially pictures—of each character and copying that picture onto the display.

The Atari uses a group of eight bytes, each consisting of eight 0s and 1s (bits) and stacked one on top of the other in a grid, to represent each character. For example, a grid like this

| | byte | value |
|----------|------|-------|
| 00000000 | #1 | 0 |
| 00011000 | #2 | 24 |
| 00111100 | #3 | 60 |
| 01100110 | #4 | 102 |
| 01100110 | #5 | 102 |
| 01111110 | #6 | 126 |
| 01100110 | #7 | 102 |
| 00000000 | #8 | 0 |

produces the capital letter "A". The eight bytes form what is known as a bit

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READER-WRITTEN PROGRAM

map of the letter. A similar eight-byte bit map is used in the Atari to represent each letter, number, operator, punctuation mark, and graphics symbol in the character set.

But enough of theory. Suffice it to say that *Custom Writer: Design* helps you build bit maps just like the ones stored in the Atari ROM, but with the characters looking any way you want them to.

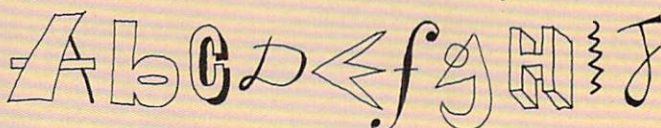
HOW TO USE CUSTOM WRITER: DESIGN

First type in the program exactly as written. (Before you start, see *Speeding Up Custom Writer: Design*, page 152.) Be sure to save

your program on either disk or tape *before* you attempt to run it (this is absolutely necessary to prevent your computer from crashing). When typing in such a long program, it's also a good idea to save your work periodically, just to make sure you don't lose it along the way.

Then type RUN, and directions will appear on the screen.

Characters may be designed in any order, and partially completed fonts (sets of characters) may be saved on disk or tape for editing later. You can design your characters by using either a joystick (plugged into port #1) or the cursor keys.



Atari w/48K RAM/Custom Writer: Design

```
10 REM ****CHARACTER SET EDITOR****
20 REM **** BY JOHN JAINSCHIGG ****
30 REM *****
40 REM *****
50 REM *****
60 GOTO 1820
70 SETCOLOR 2,12,2:SETCOLOR 4,15,8
80 PRINT CHR$(125):POKE 752,1:POKE 766,0
90 POSITION 0,0:PRINT " *****CHARACTER
EDITOR*****"
100 POSITION 10,3:PRINT "EDIT CHARACTERS"
110 POSITION 10,4:PRINT "LOAD FONT (DISK)"
120 POSITION 10,5:PRINT "LOAD FONT (CASSETTE)"
130 POSITION 10,6:PRINT "SAVE FONT (DISK)"
140 POSITION 10,7:PRINT "SAVE FONT (CASSETTE)"
150 POSITION 10,8:PRINT "PRINT/CURRENT SESSION"
160 POSITION 10,9:PRINT "PRINT/WHOLE SET"
170 POSITION 10,10:PRINT "QUIT"
180 POSITION 8,13:PRINT "USE UP AND DOWN ARRO
WS":POSITION 10,14:PRINT "TO POSITION CURSOR"
190 POSITION 4,15:PRINT "USE [RETURN] TO SELE
CT OPTION"
200 POSITION 0,22:PRINT " *****
*****"
210 X=3
220 POSITION 9,X:PRINT ">"
230 GET #2,K
240 IF K=155 THEN 300
250 IF K=ASC("=") AND X<10 THEN POSITION 9,X:
PRINT " ":X=X+1:GOTO 220
260 IF K=ASC("-") AND X>3 THEN POSITION 9,X:P
RINT " ":X=X-1:GOTO 220
270 IF K=ASC("=") AND X=10 THEN POSITION 9,X:
PRINT " ":X=3:GOTO 220
280 IF K=ASC("-") AND X=3 THEN POSITION 9,X:P
RINT " ":X=10:GOTO 220
290 GOTO 220
300 X=X-2:ON X GOTO 800,370,410,480,520,590,6
00,310
310 PRINT CHR$(125):PRINT "YOU HAVE CHOSEN TO
'QUIT'. ARE YOU SURE? (Y/N)"
320 GET #2,K:IF K=ASC("N") THEN 70
```



```

330 POKE 106,PEEK(106)+9:GRAPHICS 0:NEW
360 REM * DISK LOADING PROCEDURE *
370 PRINT CHR$(125):PRINT "DISK LOAD. INPUT F
ILENAME:":PRINT "USE 'D:' PREFIX ":INPUT NAME
$:GOSUB 585
380 TRAP 450:OPEN #1,4,0,NAME$
390 FOR X=CSET TO CSET+1023:GET #1,A:POKE X,A
:NEXT X:CLOSE #1:LFLAG=1:INDEX=-1:GOSUB 470:G
OSUB 586:GOTO 70
400 REM *CASSETTE LOADING PROCEDURE*
410 PRINT CHR$(125):"CASSETTE LOAD. INPUT FIL
ENAME:":PRINT "USE 'C:' PREFIX ":INPUT NAME$
420 TRAP 450:PRINT "POSITION TAPE, START MOTO
R.":PRINT "WHEN READY, PRESS RETURN."
430 OPEN #1,4,0,NAME$
440 FOR X=CSET TO CSET+1023:GET #1,A:POKE X,A
:NEXT X:CLOSE #1:LFLAG=1:INDEX=-1:GOSUB 470:G
OTO 70
450 POKE 559,46:TRAP 40000:CLOSE #1:PRINT CHR
$(125):"ERROR ON LOAD. PRESS ANY KEY TO":PRIN
T "RETURN TO MENU"
460 GET #2,K:GOTO 70
470 CEDIT$=" ":CEDIT$(128)=CEDIT$:CEDIT$(2)=C
EDIT$:RETURN
480 PRINT CHR$(125):"DISK SAVE. ENTER FILENAM
E.":PRINT "USE 'D:' PREFIX":INPUT NAME$:GOSUB
585
500 TRAP 570:OPEN #1,8,0,NAME$:FOR X=CSET TO
CSET+1023:PUT #1,PEEK(X):NEXT X
510 GOSUB 586:PRINT "FILE ";NAME$;" SAVED TO
DISK.":CLOSE #1:GOTO 70
520 PRINT CHR$(125):"CASSETTE SAVE. ENTER FIL
ENAME:":PRINT "USE 'C:' PREFIX":INPUT NAME$
530 PRINT "POSITION TAPE, START MOTOR.":PRINT
"WHEN READY, PRESS RETURN."
540 OPEN #1,8,0,NAME$
550 FOR X=CSET TO CSET+1023:PUT #1,PEEK(X):NE
XT X
560 PRINT "FILE ";NAME$;" SAVED TO CASSETTE."
:CLOSE #1:GOTO 70
570 TRAP 40000:CLOSE #1:PRINT CHR$(125):"ERRO
R ON SAVE. PRESS ANY KEY TO":PRINT "RETURN TO
MENU.":GET #2,K
580 GET #2,K:GOTO 70
585 PRINT "SCREEN WILL BLANK. PLEASE WAIT":FO
R DELAY=1 TO 200:NEXT DELAY:PRINT CHR$(125)
POKE 559,0:RETURN
586 POKE 559,46:RETURN
590 PFLAG=0:IF INDEX<0 THEN PRINT CHR$(125)
NO CHARACTERS EDITED YET":FOR DELAY=1 TO 20
NEXT DELAY:GOTO 70
595 GOTO 610
600 PFLAG=1
610 PRINT CHR$(125):PRINT "CHECK PRI
ER. PRESS ANY KEY TO START.":GET #2,K
620 CLOSE #7:OPEN #7,8,0,"P:":PRINT CHR$(12
5):"PRESS CTRL/P TO TERMINATE PRINTING.":PRIN
T #7
630 PUT #7,27:PUT #7,68:PUT #7,13:PUT #7,25:P
UT #7,0
640 PRINT #7;"#INTERNAL";CHR$(9);"#ATASCII";C
HR$(9);"NORM "; "NEW "; "BYTE VALUES"
650 IF PFLAG=1 THEN FOR Z=1 TO 128:GOTO 680
660 FOR Z=1 TO LEN(CEDIT$)
670 IF CEDIT$(Z,Z)=" " THEN 760
680 IF PEEK(764)=138 THEN POKE 764,255:PRINT
#7:PRINT #7:CLOSE #7:GOTO 70
690 X=Z-1:GOSUB 770
700 PRINT #7;X;CHR$(9);ATASC:CHR$(9);
710 A=USR(1545,NORM+X*8):PUT #7,27:PUT #7,75:
PUT #7,8:PUT #7,0
720 FOR Y=1615 TO 1608 STEP -1:PUT #7,PEEK(Y)
:NEXT Y:PRINT #7;" ";
730 A=USR(1545,CSET+X*8):PUT #7,27:PUT #7,75:
PUT #7,8:PUT #7,0
740 FOR Y=1615 TO 1608 STEP -1:PUT #7,PEEK(Y)
:NEXT Y:PRINT #7;" ";
750 FOR Y=CSET+X*8 TO CSET+X*8+7:PRINT #7;PEE

```

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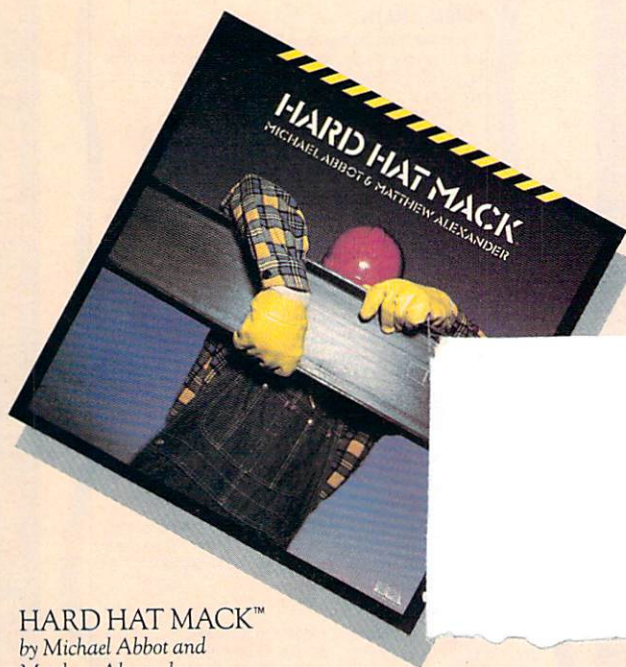
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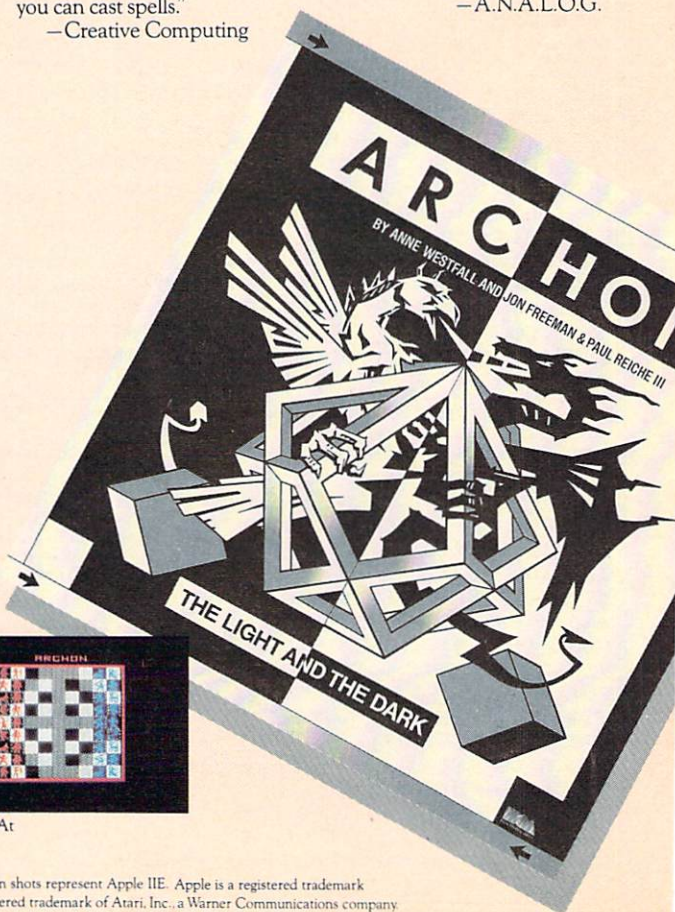
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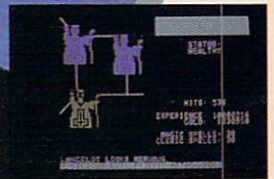
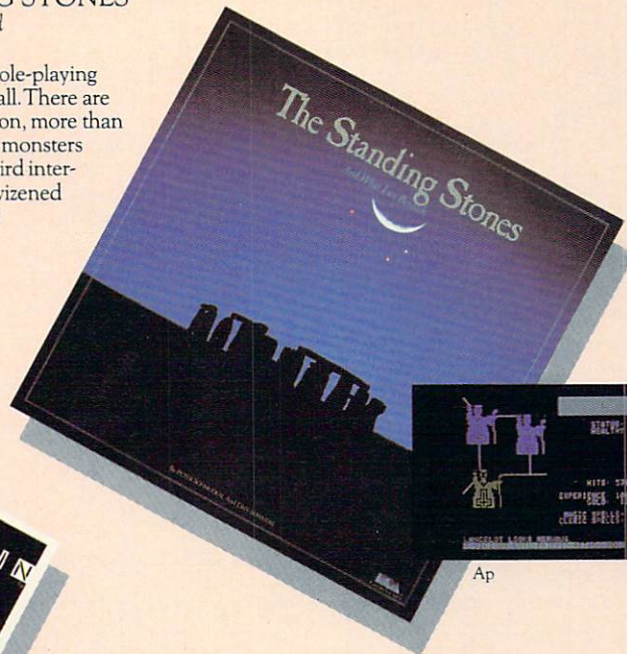
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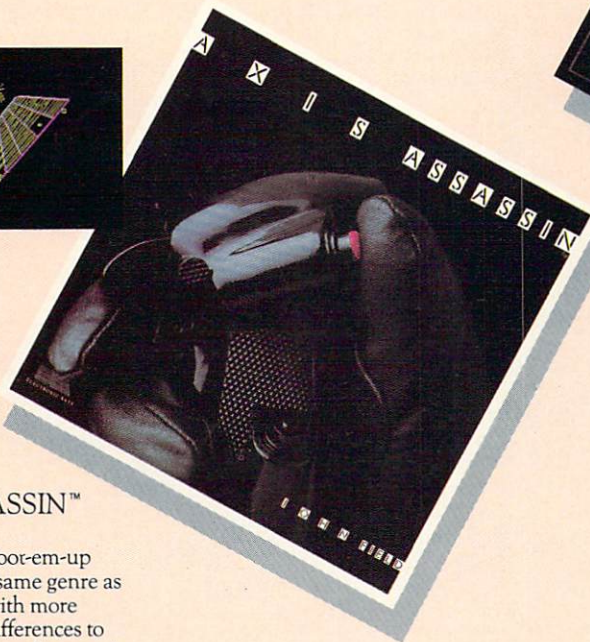
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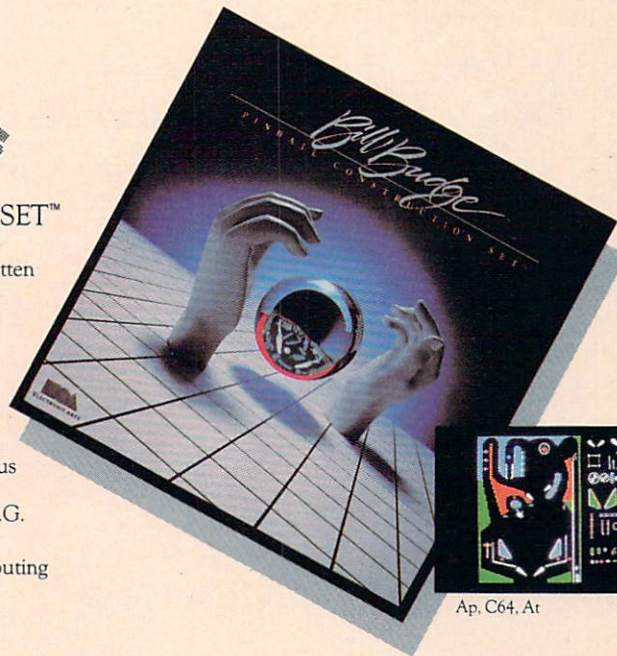
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READER-WRITTEN PROGRAMS

```

K(Y); " "; NEXT Y:PRINT #7
760 NEXT Z:PRINT #7:PRINT #7:CLOSE #7:GOTO 70
770 IF (X)=64 AND X<=95) OR (X)=192 AND X<=22
3) THEN ATASC=X-64:RETURN
780 IF (X)=0 AND X<=63) OR (X)=128 AND X<=191
) THEN ATASC=X+32:RETURN
790 ATASC=X:RETURN
800 PRINT CHR$(125):POKE 712,192:DFLAG=0:POKE
1536,64
810 D$LIST=PEEK(560)+256*PEEK(561):POKE D$LIST
T+20,130:POKE 512,0:POKE 513,6:POKE 1791,CSET
/256:POKE 54286,192
820 GOSUB 830:GOTO 870
830 POKE 766,1:SCREEN=PEEK(88)+256*PEEK(89)-1
:WINDOW=SCREEN+40*19
840 COL=4:LINE=SCREEN+761:FOR X=0 TO 127
850 IF COL=36 THEN COL=4:LINE=LINE+40
860 POKE LINE+COL,X:COL=COL+1:NEXT X:RETURN
870 COL=15:LINE=5
880 POSITION COL,LINE:PRINT CHR$(14);CHR$(14)
;CHR$(14);CHR$(14);CHR$(14);CHR$(14);CHR$(14)
;CHR$(14)
890 POSITION COL-1,LINE+1:PRINT CHR$(2);"X X
X X ";CHR$(22)
900 POSITION COL-1,LINE+2:PRINT CHR$(2);"X X
X X ";CHR$(22)
910 POSITION COL-1,LINE+3:PRINT CHR$(2);"X X
X X ";CHR$(22)
920 POSITION COL-1,LINE+4:PRINT CHR$(2);"X X
X X ";CHR$(22)
930 POSITION COL-1,LINE+5:PRINT CHR$(2);"X X
X X ";CHR$(22)
940 POSITION COL-1,LINE+6:PRINT CHR$(2);"X X
X X ";CHR$(22)
950 POSITION COL-1,LINE+7:PRINT CHR$(2);"X X
X X ";CHR$(22)
960 POSITION COL-1,LINE+8:PRINT CHR$(2);"X X
X X ";CHR$(22)
970 POSITION COL,LINE+9:PRINT CHR$(13);CHR$(1
3);CHR$(13);CHR$(13);CHR$(13);CHR$(13);CHR$(1
3);CHR$(13)
980 POKE 204,INT((P3+VX)/256):POKE 203,(P3+VX
)-PEEK(204)*256
990 POKE 206,INT((P2+VX)/256):POKE 205,(P2+VX
)-PEEK(206)*256
1000 POKE 208,INT((P1+VX)/256):POKE 207,(P1+V
X)-PEEK(208)*256
1010 REM
1020 GOSUB 1240:HX=RXH:GOSUB 1210:LINE=OLIN:C
OL=OCOL:GOTO 1150
1030 CCR=WINDOW+2*COL+LINE*40-1:POKE CCR,PEEK
(CCR)+128
1040 GET #2,K:POKE CCR,PEEK(CCR)-128
1050 IF K=ASC("*") AND COL<35 THEN COL=COL+1:
HX=HX+4:GOSUB 1210
1060 IF K=ASC("-") AND COL>4 THEN COL=COL-1:H
X=HX-4:GOSUB 1210
1070 IF K=ASC("=") AND LINE<3 THEN LINE=LINE+
1:GOSUB 1230
1080 IF K=ASC("-") AND LINE>0 THEN LINE=LINE-
1:GOSUB 1220
1090 IF K=155 THEN CHAR=LINE*32+COL-4:IF CHAR
<=127 THEN 1170
1100 IF K=19 THEN POKE 1536,(DFLAG=0)*72+(DFL
AG=1)*64:DFLAG=NOT DFLAG
1110 LAST=PEEK(712)
1120 POKE 712,(DFLAG=0)*192+(DFLAG=1)*240
1130 IF LAST<>PEEK(712) THEN 1150
1140 GOTO 1030
1150 IF PEEK(712)=192 THEN POSITION 13,3:PRIN
T "****ATARI****":GOTO 1030
1160 POSITION 13,3:PRINT "***REDEFINED**":GOTO
1030
1170 SOUND 0,131,10,10:FOR DELAY=1 TO 10:NEXT
DELAY:SOUND 0,0,0,0
1180 PAR=SCREEN:GOSUB 2680:POSITION 2,0:PRINT
"IS THAT THE CHARACTER YOU WANT?(Y/N)":GET #
2,K:IF K=89 THEN 1270

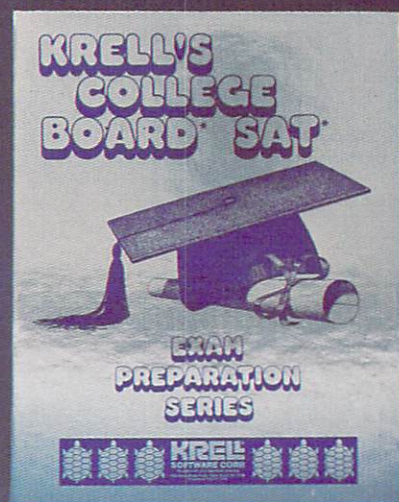
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```

1190 PAR=SCREEN:GOSUB 2680:GOSUB 1240:GOTO 11
50
1200 REM *PLAYER MOVEMENT SUBS*
1210 POKE 53248,HX:POKE 53249,HX:POKE 53250,H
X:RETURN
1220 A=USR(ADR(PUP$),2):RETURN
1230 A=USR(ADR(PDOWN$),2):RETURN
1240 POSITION 7,0:PRINT "USE CURSOR KEYS TO P
OINT.":PRINT " USE [RETURN] TO SELECT."
1250 PRINT " USE [CTRL/S] TO SWITCH SETS"
1260 RETURN
1270 VX=PEEK(203)+256*PEEK(204)-P3:RXH=HX:HX=
0:OLIN=LINE:OCOL=COL:GOSUB 1210
1280 PTR=CSET+CHAR*8:FOR X=0 TO 7:PAR=PEEK(P
T R+X):PAR2=ADR(A$)+X*8:GOSUB 2610:NEXT X
1290 COL=15:LINE=6
1300 FOR X=1 TO 64
1310 IF COL=23 THEN COL=15:LINE=LINE+1
1320 POSITION COL,LINE:IF A$(X,X)=CHR$(160) T
HEN PRINT CHR$(160):GOTO 1340
1330 PRINT " "
1340 COL=COL+1:NEXT X
1350 REM *DO NOT OMIT THIS LINE*
1360 POKE 204,INT((P4+V4)/256):POKE 203,(P4+V
4)-PEEK(204)*256-1:REM P4 VERT.
1370 REM *JOYSTICK AND CURSOR CONTROL*
1380 GOSUB 1650:POKE 53251,H:POKE 764,255:GOT
O 1600
1390 REM *DO NOT OMIT THIS LINE*
1400 IF (STICK(0)=7 OR PEEK(764)=7) AND Q<8 T
HEN Q=Q+1:H=H+4:POKE 53251,H:POKE 764,255
1410 IF (STICK(0)=11 OR PEEK(764)=6) AND Q>1
THEN Q=Q-1:H=H-4:POKE 53251,H:POKE 764,255
1420 IF (STICK(0)=13 OR PEEK(764)=15) AND R<7
THEN R=R+1:A=USR(ADR(PDOWN$),1):POKE 764,255
1430 IF (STICK(0)=14 OR PEEK(764)=14) AND R>0
THEN R=R-1:A=USR(ADR(PUP$),1):POKE 764,255
1440 P=Q+R*8:LAT=14+Q:VERT=6+R
1450 IF (STRIG(0)=0 OR PEEK(764)=33) AND A$(P
,P)=CHR$(32) THEN 1470
1460 GOTO 1480
1470 A$(P,P)=CHR$(160):POSITION LAT,VERT:PRIN
T CHR$(160):GOTO 1620
1480 IF (STRIG(0)=0 OR PEEK(764)=33) AND A$(P
,P)=CHR$(160) THEN 1500
1490 GOTO 1510
1500 A$(P,P)=CHR$(32):POSITION LAT,VERT:PRINT
CHR$(32):GOTO 1620
1510 REM * TERMINATE EDIT *
1520 IF PEEK(764)=28 THEN GOSUB 1640:GOTO 169
0
1530 REM * ABORT EDIT *
1540 IF PEEK(764)=191 THEN GOSUB 1640:PRINT "
":GOTO 820
1550 IF PEEK(764)=190 THEN POKE 764,255:POKE
1536,(DFLAG=1)*64+(DFLAG=0)*72:DFLAG=NOT DFL
AG
1560 LAST=PEEK(712)
1570 POKE 712,(DFLAG=0)*192+(DFLAG=1)*240
1580 IF LAST<>PEEK(712) THEN 1600
1590 GOTO 1390
1600 IF PEEK(712)=192 THEN POSITION 13,4:PRIN
T "****ATARI****":GOTO 1390
1610 POSITION 13,4:PRINT "***REDEFINED**":GOTO
1390
1620 POKE 764,255:SOUND 0,131,10,10:FOR DELAY
=1 TO 10:NEXT DELAY:SOUND 0,0,0,0:GOTO 1390
1630 REM ***EXIT ROUTINE***
1640 HX=RXH:V4=(PEEK(203)+256*PEEK(204))-P4+1
:POKE 764,255:POKE 766,0:POKE 53251,0:RETURN
1650 PAR=SCREEN:GOSUB 2680
1660 POSITION 6,0:PRINT "USE CURSOR KEYS OR J
OYSTICK":POSITION 3,1:PRINT " TO EDIT. USE S
TICK TRIGGER OR"
1670 POSITION 8,2:PRINT "SPACEBAR TO PLOT POI
NTS"
1680 PRINT " [ESC]=EXIT [CTRL/A] ABORTS EDI
T":RETURN

```


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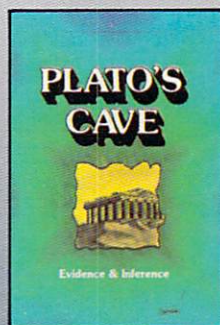
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READER-WRITTEN PROGRAMS

```

1690 CEDIT$(CHAR+1,CHAR+1)=CHR$(CHAR):INDEX=I
NDEX+1
1700 FOR X=0 TO 7:PAR=ADR(A$)+X*8:GOSUB 2550:
POKE PTR+X,A:NEXT X
1710 REM *DO NOT OMIT THIS LINE*
1720 REM *DO NOT OMIT THIS LINE*
1730 POKE 712,192:POKE 1536,64:DFLAG=0:PAR=WI
NDOW:GOSUB 2680
1740 PAR=SCREEN:GOSUB 2680:POSITION 2,0:PRINT
"PRESS (1) TO RETURN TO CHARACTER"
1750 PRINT "PRESS (2) TO SELECT ANOTHER CHARA
CTER"
1760 PRINT "PRESS (3) FOR MENU"
1770 GET #2,K:K=K-48
1780 IF K=1 THEN PAR=SCREEN:GOSUB 2680:POKE 7
66,1:GOSUB 830:GOTO 1360
1790 IF K=2 THEN PRINT CHR$(125):GOTO 820
1800 IF K=3 THEN PRINT CHR$(125):POKE 1536,64
:DFLAG=0:GOTO 70
1810 GOTO 1770
1820 POKE 106,PEEK(106)-9:GRAPHICS 0:SPACE=(P
EEK(106)+1)*256:CSET=SPACE:PMTAB=SPACE+1024
1830 POKE 752,1:POKE 77,128:SETCOLOR 2,12,6:S
ETCOLOR 4,3,8:POSITION 3,10:PRINT "PLEASE WAI
T. PROGRAM INITIALIZING"
1840 DIM A$(64),CEDIT$(128),C$(1),NAME$(10),P
DWN$(61),PUP$(65)
1850 CEDIT$=" ":CEDIT$(128)=CEDIT$:CEDIT$(2)=
CEDIT$
1860 A$=" ":A$(64)=A$:A$(2)=A$
1870 RHX=64:H=104:Q=1:R=0:INDEX=-1:NORM=57344
:OLIN=0:OCOL=4
1880 RESTORE 1880:FOR X=1536 TO 1544:READ A:P
OKE X,A:NEXT X:DATA 72,173,255,6,141,9,212,10
4,64
1890 P1=PMTAB+512:P2=PMTAB+640:P3=PMTAB+768:P
4=PMTAB+896
1900 FOR X=P1 TO PMTAB+1024:POKE X,0:NEXT X:R
EM CLEAR PLAYER SPACES
1910 RESTORE 1910:V4=40:FOR X=P4+V4 TO P4+V4+
3:READ A:POKE X,A:NEXT X:DATA 6,15,15,6
1920 VX=74:FOR X=P3+VX TO P3+VX+14:READ A:POK
E X,A:NEXT X
1930 FOR X=P2+VX TO P2+VX+14:READ A:POKE X,A:
NEXT X
1940 FOR X=P1+VX TO P1+VX+14:READ A:POKE X,A:
NEXT X
1950 DATA 0,0,255,255,255,255,255,255,255
,254,192,192,192,192
1960 DATA 0,0,0,0,0,0,0,0,42,42,42,0,0,0,0
1970 DATA 255,255,255,0,0,0,0,0,0,0,0,0,0,0
1980 POKE 53248,0:POKE 53249,0:POKE 53250,0:P
OKE 53251,0:REM HORIZONTAL POSITIONS
1990 POKE 704,74:POKE 705,0:POKE 706,10:POKE
707,86:REM PLAYER COLORS
2000 POKE 54279,PMTAB/256:POKE 559,46:POKE 53
277,3:REM DMA ENABLE
2010 RESTORE 2020:FOR X=1545 TO 1615:READ A:P
OKE X,A:NEXT X
2020 DATA 104,165,203,168,165
2030 DATA 204,170,104,133,204
2040 DATA 104,133,203,152,72
2050 DATA 138,72,160,7,177
2060 DATA 203,153,64,6,136
2070 DATA 16,248,162,7,160
2080 DATA 7,24,185,64,6
2090 DATA 42,153,64,6,126
2100 DATA 72,6,136,16,242
2110 DATA 202,16,237,104,165
2120 DATA 204,104,165,203,96
2130 DATA 0,0,0,0,0
2140 DATA 0,0,0,0,0
2150 DATA 0,0,0,0,0
2160 DATA 0
2170 REM PLAYER MISSILE CONTROL ROUTINE
2180 RESTORE 2190:FOR X=1 TO 65:READ A:PUP$(X
,X)=CHR$(A):NEXT X
2190 DATA 104,104,104,201,1

```

```

2200 DATA 208,21,162,4,160
2210 DATA 1,177,203,136,145
2220 DATA 203,192,5,200,200
2230 DATA 144,245,198,203,202
2240 DATA 208,238,96,162,4
2250 DATA 160,1,177,203,136
2260 DATA 145,203,200,177,205
2270 DATA 136,145,205,200,177
2280 DATA 207,136,145,207,192
2290 DATA 16,200,200,144,233
2300 DATA 198,203,198,205,198
2310 DATA 207,202,208,222,96
2320 RESTORE 2330:FOR X=1 TO 61:READ A:PDWN$(
X,X)=CHR$(A):NEXT X
2330 DATA 104,104,104,201,1
2340 DATA 208,19,162,4,160
2350 DATA 5,177,203,200,145
2360 DATA 203,136,136,16,247
2370 DATA 230,203,202,208,240
2380 DATA 96,162,4,160,16
2390 DATA 177,203,200,145,203
2400 DATA 136,177,205,200,145
2410 DATA 205,136,177,207,200
2420 DATA 145,207,136,136,16
2430 DATA 235,230,203,230,205
2440 DATA 230,207,202,208,224
2450 DATA 96
2451 OPEN #2,4,0,"K":POKE 77,0
2460 REM **TRANSFER CHARACTER SET**
2470 ROMSET=PEEK(756)*256
2480 COUNT=0
2490 FOR LOOP=ROMSET TO ROMSET+1023
2500 POKE CSET+COUNT,PEEK(LOOP)
2510 COUNT=COUNT+1
2520 NEXT LOOP
2530 GOTO 70
2540 REM **TURN GRIDLINES TO BINARY #S**
2550 A=0:COUNT=0
2560 FOR LOOP=1 TO 8
2570 IF PEEK(PAR+COUNT)=160 THEN A=A+INT(2^(8
-LOOP)+0.5)
2580 COUNT=COUNT+1:NEXT LOOP
2590 RETURN
2600 REM *TURN BINARY NUMBERS TO GRIDLINES**
2610 FOR LOOP=7 TO 0 STEP -1
2620 IF PAR/2>INT(PAR/2) THEN POKE PAR2+LOOP,
160:GOTO 2640
2630 POKE PAR2+LOOP,32
2640 PAR=INT(PAR/2)
2650 NEXT LOOP
2660 RETURN
2670 REM *CLEAR SCREEN*
2680 FOR LOOP=PAR TO PAR+199
2690 POKE LOOP,0:NEXT LOOP:RETURN

```

SPEEDING UP CUSTOM WRITER: DESIGN

My original version of *Custom Writer: Design* contained several machine-language subroutines that I have translated here into BASIC to make the operation of the program easier to understand. However, these BASIC subroutines cause the program to run very slowly. If you intend to use *Custom Writer: Design* frequently, or to design quite a few characters at one sitting, you can put my machine-language routines back into the program. It will then run much faster, and, in addition, it will display the values of each line of the character grid as you change the character (try it and see!).

To add the machine-language routines, enter the program as shown up to line 2450. Then type in the following lines:

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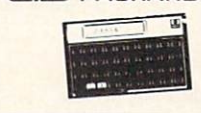
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READER-WRITTEN PROGRAMS

```

2451 REM
2460 REM **TRANSFER CHARACTER SET**
2470 RESTORE 2480:FOR X=1616 TO 1635:READ A:P
OKE X,A:NEXT X
2480 DATA 104,104,141,95,6
2490 DATA 104,141,94,6,162
2500 DATA 199,169,0,157,93
2510 DATA 6,202,208,250,96
2520 REM FLASH CHARACTER ROUTINE
2530 RESTORE 2540:FOR X=1 TO 35:READ A:EORCH$
(X,X)=CHR$(A):NEXT X
2540 DATA 104,165,203,168,165
2550 DATA 204,170,104,133,204
2560 DATA 104,133,203,152,72
2570 DATA 138,72,160,7,177
2580 DATA 203,73,255,145,203
2590 DATA 136,16,247,104,165
2600 DATA 204,104,165,203,96
2610 REM BLOCK MOVE ROUTINE
2620 RESTORE 2630:FOR X=1 TO 34:READ A:TSET$(
X,X)=CHR$(A):NEXT X
2630 DATA 104,104,133,206,104
2640 DATA 133,205,169,0,133
2650 DATA 203,169,224,133,204
2660 DATA 162,4,160,0,177
2670 DATA 203,145,205,136,208
2680 DATA 249,230,206,230,204
2690 DATA 202,208,240,96
2700 RESTORE 2710:FOR X=1 TO 43:READ A:CMAT$(
X,X)=CHR$(A):NEXT X
2710 DATA 104,165,203,168,165
2720 DATA 204,170,104,133,204
2730 DATA 104,133,203,152,72
2740 DATA 138,72,160,7,24
2750 DATA 177,203,201,160,208
2760 DATA 1,56,102,212,136
2770 DATA 16,243,104,133,204
2780 DATA 104,133,203,169,0
2790 DATA 133,213,96
2800 RESTORE 2810:FOR X=1 TO 41:READ A:CGRID$(
X,X)=CHR$(A):NEXT X
2810 DATA 104,165,203,168,165,204,170
2820 DATA 104,133,204,104,133
2830 DATA 203,152,72,138,72
2840 DATA 160,7,169,32,24
2850 DATA 110,139,2,144,2
2860 DATA 169,160,145,203,136
2870 DATA 16,241,104,133,204
2880 DATA 104,133,203,96
2890 RESTORE 2900:FOR X=1 TO 25:READ A:DISK$(
X,X)=CHR$(A):NEXT X
2900 DATA 104,104,141,85,3
2910 DATA 104,141,84,3,169
2920 DATA 0,141,88,3,169
2930 DATA 4,141,89,3,162
2940 DATA 16,32,86,228,96
2950 OPEN #2,4,0,"K":POKE 77,0:RETURN

```

(If you've already typed in the complete BASIC version, you can just type in the above lines and they will replace the lines with the same numbers.) Finally, enter the following lines:

```

60 GOSUB 1820:A=USR(ADR(TSET$),CSET)
370 PRINT CHR$(125):PRINT "DISK LOAD. INPUT F
ILENAME:":PRINT "USE 'D:' PREFIX":INPUT NAME$
390 POKE 850,7:A=USR(ADR(DISK$),CSET):CLOSE #
1:LFLAG=1:INDEX=-1:GOSUB 470:GOTO 70
480 PRINT CHR$(125):"DISK SAVE:ENTER FILENAME
":PRINT "USE 'D:' PREFIX":INPUT NAME$
500 TRAP 570:OPEN #1,8,0,NAME$:POKE 850,11:A=
USR(ADR(DISK$),CSET)
510 PRINT "FILE ";NAME$;" SAVED TO DISK":CLOS
E #1:GOTO 70
585 REM
586 REM
1180 A=USR(1616,SCREEN):POSITION 2,0:PRINT "I
S THAT THE CHARACTER YOU WANT(Y/N)?:GET #2,K
:IF K=ASC("Y") THEN 1270

```

```

1190 A=USR(1616,SCREEN):GOSUB 1240:GOTO 1150
1280 PTR=CSET+CHAR*8:FOR X=0 TO 7:POKE 651,PE
EK (PTR+X):A=USR(ADR(CGRID$),ADR(A$)+(X*8)):NE
XT X
1350 FOR X=0 TO 7:POSITION 26,X+6:A=USR(ADR(C
MAT$),ADR(A$)+(X*8)):PRINT A;" "":NEXT X
1390 A=USR(ADR(CMAT$),ADR(A$)+R*8):POSITION 2
6,R+6:PRINT A;" "
1650 A=USR(1616,SCREEN)
1700 FOR X=0 TO 7:A=USR(ADR(CMAT$),ADR(A$)+X*
8):POKE PTR+X,A:NEXT X
1720 IF CHAR<>0 THEN FOR X=1 TO 6:A=USR(ADR(E
ORCH$),PTR):FOR DELAY=1 TO 10:NEXT DELAY:NEXT
X
1730 POKE 712,192:POKE 1536,64:DFLAG=0:A=USR(
1616,WINDO)
1740 A=USR(1616,SCREEN):POSITION 2,0:PRINT "P
RESS (1) TO RETURN TO CHARACTER"
1780 IF K=1 THEN A=USR(1616,SCREEN):POKE 766,
1:GOSUB 830:GOTO 1360
1840 DIM A$(64),CEDIT$(128),C$(1),NAME$(10),T
SET$(34),DISK$(25),EORCH$(35),CMAT$(43),CGRID
$(41),PDWN$(61),PUF$(65)

```

MAKING YOUR PRINTOUTS UNIQUE

Once you have designed a character set and saved it on disk or tape, *Custom Writer: Print* allows you to substitute your own special typeface in place of the standard font on any Epson MX- or FX-series printer that has Grafrax graphics capabilities.

When you RUN, you will be asked to supply the name under which you have stored your character set on disk or tape. The program then executes its first routine (in DATA statements 20-210), which makes adjustments in your characters so that the Epson can print them out.

Print then loads another machine-code subroutine into memory from DATA statements 300-730. This routine instructs the Atari how to send your special characters to the printer. Once *Print* has finished executing, it will disappear (by executing the NEW statement in line 750), leaving behind its second subroutine and your special character set hidden away in memory.

To send text translated into your special characters to the printer, you need perform only two steps in BASIC. The first step is to open an output channel to your printer (the special print routine uses channel #5). To do this, turn on your Epson and enter the following command: OPEN #5,8,0,"P:"

Second, you must activate the special printing function by entering A=USR(1536)

You can type these two BASIC statements in directly, or you can place line numbers in front of them and include them in a BASIC program, as we've done in the *Electronic Typewriter* program, but you must perform both steps and in the above order.

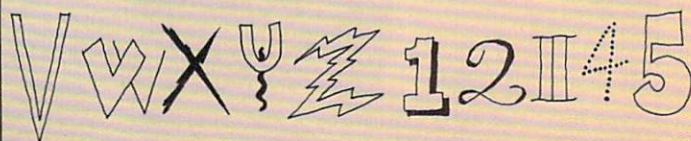
You can then print out text in your special characters by using the command format below.

PRINT #5;"(your text)"

Unfortunately, this special print routine does not permit the use of Epson special print functions. It can only print a maximum of 50 characters per line, each character being eight graphics columns wide.

After installing this routine, if you want to switch to normal printing, turn off the special print routine by entering CLOSE #5

To switch back to printing your customized characters, follow the same two steps shown above. →



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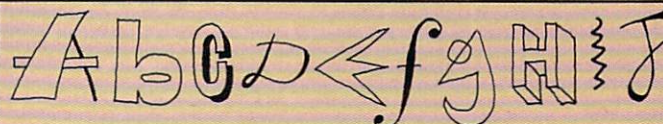


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Atari w/48K RAM/Custom Writer: Print

```

10 FOR X=1536 TO 1631:READ A:POKE X,A:NEXT X
20 DATA 166,106,232,232,142
30 DATA 21,6,142,45,6
40 DATA 173,23,6,72,160
50 DATA 7,162,7,24,126
60 DATA 0,6,110,94,6
70 DATA 202,16,246,206,23
80 DATA 6,136,208,238,104
90 DATA 141,23,6,162,7
100 DATA 189,87,6,157,0
110 DATA 6,202,16,247,173
120 DATA 95,6,201,128,240
130 DATA 29,24,169,8,109
140 DATA 20,6,141,20,6
150 DATA 141,44,6,169,0
160 DATA 109,21,6,141,21
170 DATA 6,141,45,6,238
180 DATA 95,6,76,10,6
190 DATA 104,96,0,0,0
200 DATA 0,0,0,0,0
210 DATA 0
220 POKE 106,PEEK(106)-6:GRAPHICS 0
230 DIM N$(20):PRINT "ENTER CHARACTER SET FILENAME":INPUT N$
240 CBASE=(PEEK(106)+2)*256:CLOSE #1:OPEN #1,4,0,N$
250 FOR X=CBASE TO CBASE+1023:GET #1,A:POKE X,A:NEXT X:CLOSE #1
260 PRINT "CHARACTER SET IN PLACE"
270 PRINT "REVISING CHARACTER SET FOR PRINTING":A=USR(1536)
280 PRINT "NOW LOADING PRINT SUBROUTINE"
290 FOR X=1536 TO 1753:READ A:POKE X,A:NEXT X
300 DATA 104,164,106,200,132
310 DATA 204,200,140,216,6
320 DATA 160,0,132,203,140
330 DATA 215,6,160,255,132
340 DATA 205,160,33,136,140
350 DATA 150,3,160,6,140
360 DATA 151,3,96,230,205
370 DATA 164,205,145,203,201
380 DATA 155,208,9,165,205
390 DATA 201,0,208,10,76
400 DATA 181,6,192,49,240
410 DATA 8,160,1,96,198
420 DATA 205,76,65,6,200
430 DATA 132,206,160,0,132
440 DATA 207,32,201,6,165
450 DATA 206,141,95,6,165
460 DATA 207,141,100,6,169
470 DATA 27,32,167,238,169
480 DATA 75,32,167,238,169
490 DATA 0,32,167,238,169
500 DATA 0,32,167,238,160
510 DATA 0,177,203,132,208
520 DATA 41,127,168,42,42
530 DATA 42,42,41,3,170
540 DATA 152,41,159,29,246
550 DATA 254,133,206,169,0
560 DATA 133,207,32,201,6
570 DATA 24,173,215,6,101
580 DATA 206,133,206,173,216
590 DATA 6,101,207,133,207
600 DATA 160,0,177,206,140
610 DATA 217,6,32,167,238
620 DATA 172,217,6,200,192
630 DATA 8,208,240,198,205
640 DATA 16,3,76,181,6
650 DATA 164,208,200,76,106
660 DATA 6,169,155,32,167
670 DATA 238,169,0,133,208
680 DATA 133,206,133,207,169

```

```

690 DATA 255,133,205,160,1
700 DATA 96,24,38,206,38
710 DATA 207,38,206,38,207
720 DATA 38,206,38,207,96
730 DATA 0,0,0
740 PRINT "INSTALLATION COMPLETE"
750 NEW

```

CREATING A CUSTOMIZED ELECTRONIC TYPEWRITER

Once you've run *Custom Writer: Print*, you'll need to write a BASIC program (or use a BASIC program you already have and substitute PRINT #5 for your PRINT statements) to make full use of your new abilities. Here is a simple BASIC program that gives you an idea of how you can use the PRINT #5 statement, and turn your Atari and Epson into an *Electronic Typewriter* of sorts. As you type, your letters will appear on the Atari screen in the standard character set; but when you press RETURN at the end of the line, your Epson will print what you've typed on the screen, only using your own personal character set.

Atari w/48K RAM/Custom Writer: Electronic Typewriter

```

10 REM ***ELECTRONIC TYPEWRITER***
20 PRINT CHR$(125)
30 PRINT "ELECTRONIC TYPEWRITER"
40 PRINT :PRINT "INPUT ONE LINE OF TEXT AT A TIME,"
50 PRINT "FOLLOWING EACH LINE WITH A [RETURN]"
60 PRINT "PRESS [BREAK] TO QUIT"
70 POSITION 8,20:PRINT "PRESS ANY KEY TO START":POKE 764,255
80 IF PEEK(764)=255 THEN 80
90 OPEN #5,8,0,"P:"
100 A=USR(1536)
110 POKE 764,255
120 OPEN #1,12,0,"E:"
130 GET #1,K
140 PRINT #5;CHR$(K);
150 GOTO 130

```

GIVING YOUR SCREEN A SPECIAL LOOK

Custom Writer: Display allows you to temporarily substitute your customized character set on the screen in place of the normal Atari characters. You can also use it to create special graphics effects; for example, Lon Poole's *Your Atari Computer* (Osborne Press) has a good discussion of how to use special character sets for animation.

Once *Display* has finished executing, you can switch back and forth freely between the standard character set and your own. To return to the normal character set, enter POKE 756, 224 and to reengage your own, enter POKE 756, PEEK(106)+1. Finally to bring everything back to normal, either turn off your computer or press RESET.

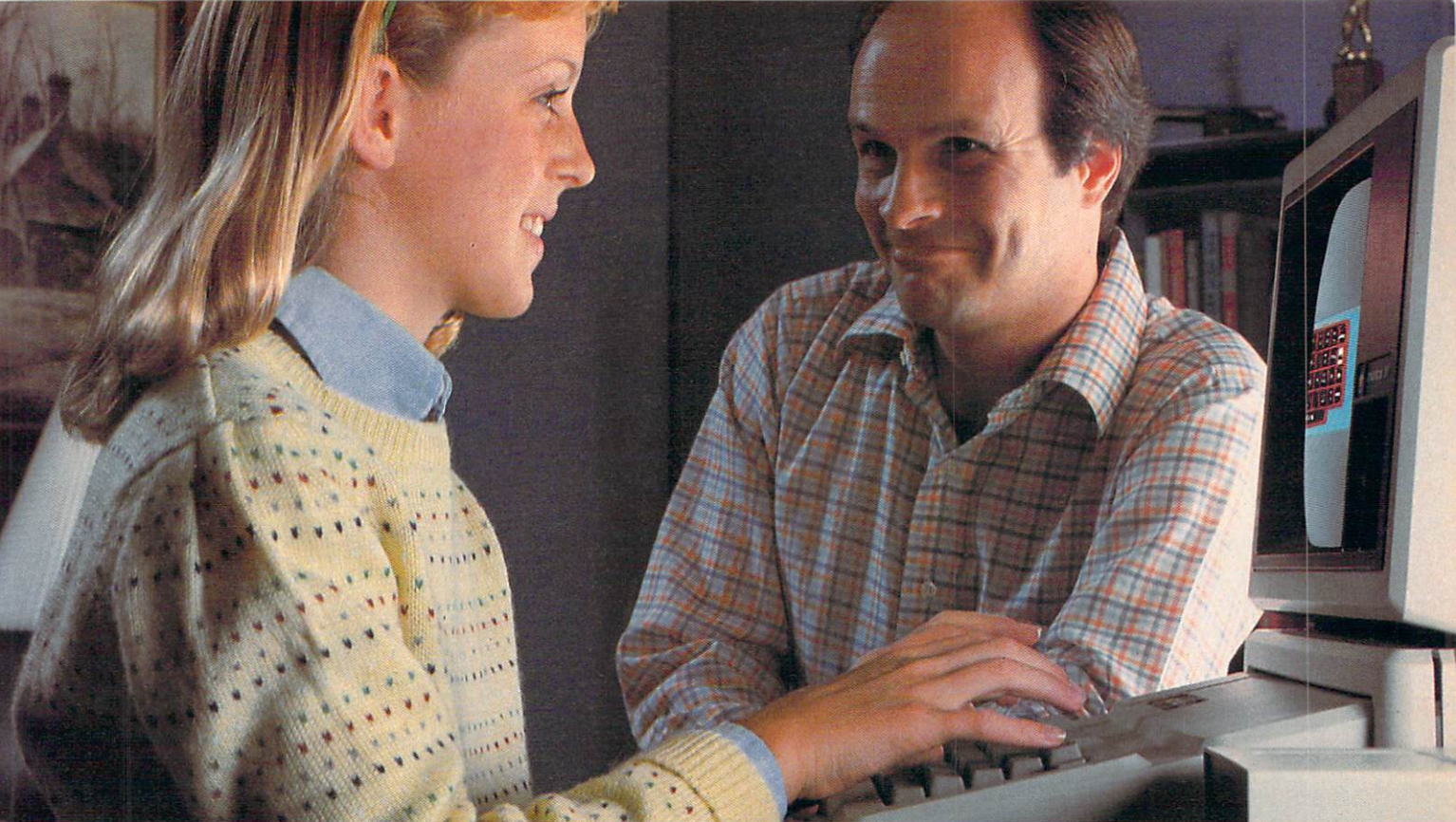
That's about it. I hope you enjoy the program, and if you have questions, please send them to Bob—preferably written in some strange character set of your own devising.

Atari w/48K RAM/Custom Writer: Display

```

10 DIM NAME$(15):POKE 710,2
20 POKE 106,PEEK(106)-6:GRAPHICS 0
30 PRINT "ENTER CHARACTER SET FILENAME":INPUT NAME$
40 TRAP 90:OPEN #1,4,0,NAME$
50 CSET=PEEK(106)+2:CBASE=CSET*256
60 FOR X=CBASE TO CBASE+1023:GET #1,A:POKE X,A:NEXT X
70 POKE 756,CSET
80 NEW
90 PRINT "ERROR. PLEASE REENTER FILENAME":CLOSE #1:GOTO 30

```

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WHAT'S IN STORE

NEW HARDWARE ANNOUNCEMENTS*

SAKATA MONITOR; CHALKBOARD POWER PAD; TIMEX 2068

COMPUTERS



Atari 1400XL

MANUFACTURER: Atari Inc., 1265 Borregas Ave., Sunnyvale, CA 94086; (408) 745-2000
PRICE: \$600-800 [Editor's estimate.]

Expected to be released sometime this winter, the Atari 1400XL represents a big step forward for the Atari computer line. It comes with a built-in voice synthesizer and a direct-connect modem. The modem allows the user to connect, via the telephone lines, with data bases, information services, and other computer users. The voice synthesizer converts text to speech.

Atari has kept in the 1400XL the same sound and color chips that distinguished its earlier computers as great gaming devices. The 1400XL has 64K RAM (unexpandable), 66 keys on a full-stroke keyboard, and built-in BASIC. More than 2,000 programs are currently available.

Timex Sinclair 2000

MANUFACTURER: Timex Computer Corp., P.O. Box 2655, Waterbury, CT 06725; (203) 573-5000
PRICE: \$149 (24K); \$199 (48K)

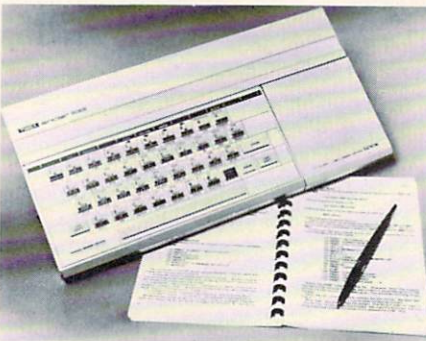
The new Timex Sinclair 2000 Series computers feature high-resolution color graphics, fully programmable sound, and raised keys. These are all improvements over the TS 1000, which had only black-and-white lo-res graphics and a membrane keyboard. In addition, the 2048 (with

24K RAM) and the 2068 (with 48K) have lowercase letters and can be hooked to either a TV or a monitor. Screen display is 32 characters wide, and 24 lines deep. Eight colors can be displayed, and a built-in speaker has a 10-octave range.

The 2000 Series keeps one of the best features of the TS 1000—the "one-touch key-word commands," which allow the user to enter programming commands by depressing one key.

Loading programs is possible with a tape recorder and with the new Timex mini-cartridges that plug directly into the computers. The TS 2000 computers are compatible with the TS 2040 thermal printer; Timex has also promised to introduce a modem for telecommunications.

The new Timex computers, including the TS 1500, were not in the stores by late fall, but should make an appearance for the gift-giving season.



TRS-80 PC-4

MANUFACTURER: Tandy Corp., 1800 One Tandy Center, Ft. Worth, TX 76102; (817) 390-3300
PRICE: \$69

For the businessperson or student on the go, Radio Shack has an answer: a purse- or briefcase-size computer. The PC-4 has 53 keys for programmers, and a 10-key numeric keypad for mathematicians. Built-in math functions include trig, log, square root, exponent, and absolute values.

The Liquid Crystal Display shows 12 characters at once, and scrolls horizontally to show a total of 62. Lowercase characters are possible in "extension mode."

The PC's memory is quite small

(less than 1K), but can hold 10 short programs, or 544 program steps. BASIC is built-in. Approximately the size of calculators of the mid-1970s, the PC-4 measures six by two inches. The PC-4 printer (\$79) prints 20 characters a line. A cassette interface (\$39) can be used to connect



with a tape recorder. The whole computer system operates on lithium batteries.

MONITORS

Sakata SC-100

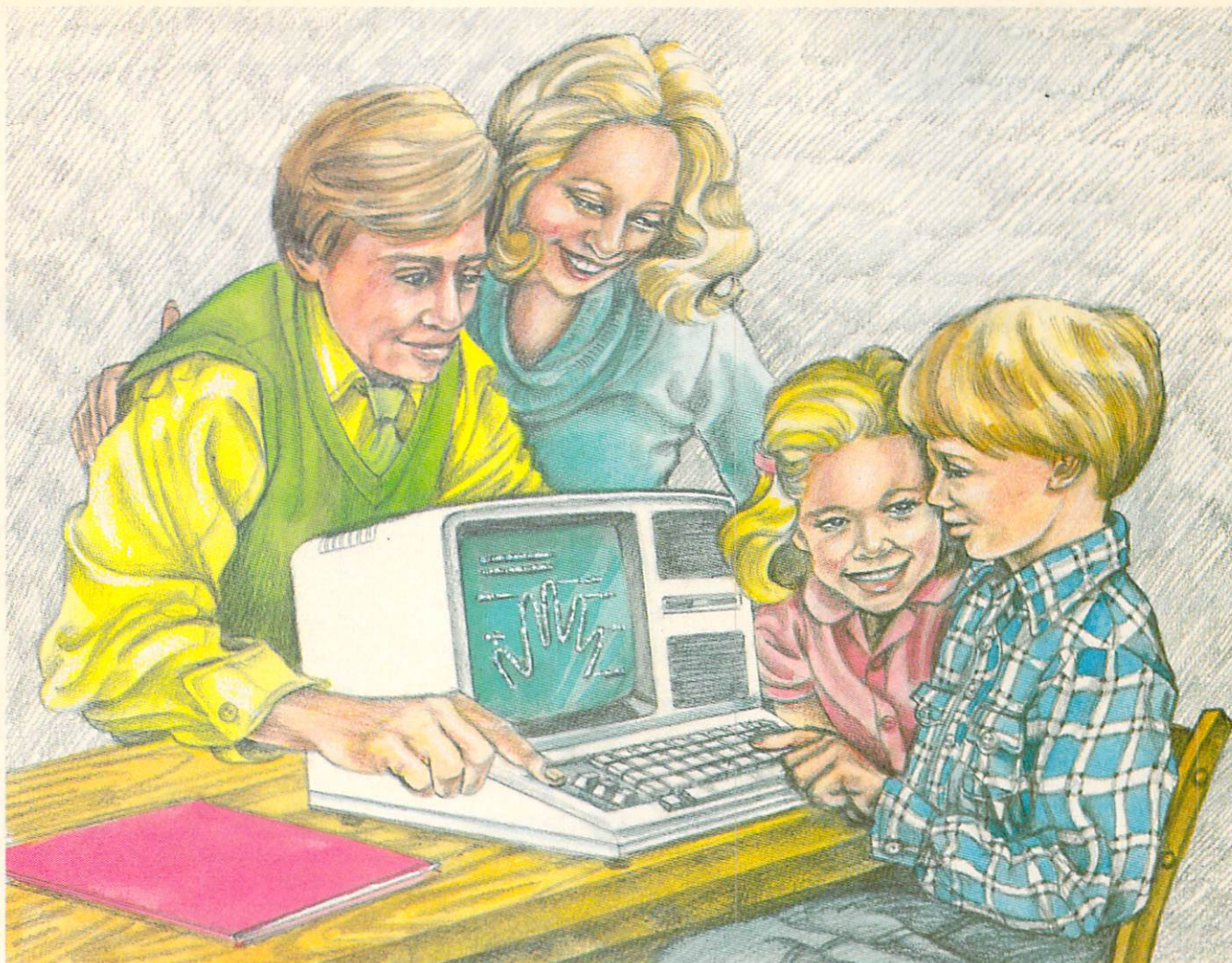
MANUFACTURER: Sakata U.S.A. Corp., 651 Bonnie Ln., Elk Grove Village, IL 60007; (312) 593-3211
PRICE: \$329

Sakata's color monitor combines a high-quality picture with precision picture control. The sleek and attractive 13-inch SC-100 can display a minimum of eight colors. It is compatible with the Apple II plus and IIe, Atari 800, Commodore 64,



VIC-20, IBM PC, TI-99/4A, and Osborne computers. With its extremely low vertical and horizontal picture distortion, the graphics display quality is superior. →

*These products have been announced by the manufacturers, but are not necessarily in the stores or even in production yet. Some are still under development. Call or write the manufacturer to find out when they will be available.



KEYBOARDING ALPHA-PAC For The Entire Family

Mom, Dad, and Kids . . . do you "hunt and peck" for each and every key on your home computer? If you do, you're wasting a lot of precious time, and saving time is one reason you purchased your home computer, isn't it?

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graphics displayed on the screen will show you which fingers should strike which keys, how to move your fingers, how to sit properly at the keyboard, and the correct way to position your hands over the keys.

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☐ Please bill to my VISA:

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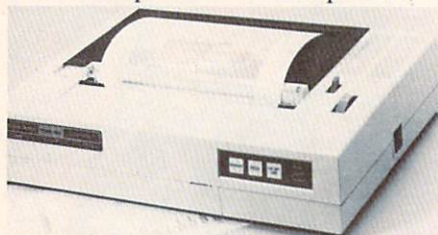
WHAT'S IN STORE NEW HARDWARE

PRINTERS

TRS-80 CGP-220

MANUFACTURER: Tandy Corp., 1800 One Tandy Center, Ft. Worth, TX 76102; (817) 390-3300
PRICE: \$699

Radio Shack's ink-jet printer is more expensive and slower than the Transtar, but, like the Transtar, it prints seven colors with a resolution of 640 dots per line. It prints text at 37 characters per second. The printer,



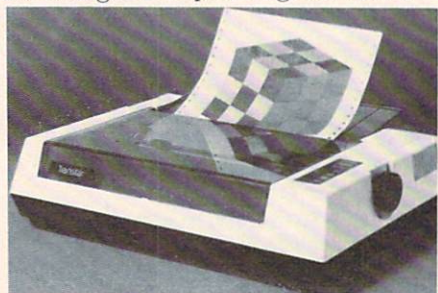
of course, is compatible with all Radio Shack TRS-80 computers, and its dual parallel and serial interfaces allow connection to a variety of other brands.

Transtar 315

MANUFACTURER: Omega Northwest Inc., Box C-96975, Bellevue, WA 98009; (206) 454-9250
PRICE: \$595

The Transtar dot-matrix printer, designed primarily for Apple and IBM PC computers, is a reasonably priced color printer. It prints seven colors (black, magenta, yellow, cyan, green, orange, violet) and up to 30 shades of these colors with its four-hammer print head and four-color cartridge ribbon.

The printer is somewhat slower than most dot-matrix types (50 characters per second), and its letter formation is not as clear as some others, so it should not be considered for straight text printing. However,



if you want to see your LOGO drawings on paper, the Transtar's graphics resolution is excellent, allowing 640 dots per eight-inch line. Like most good printers, the Transtar is manufactured in Japan, by Seikosha.

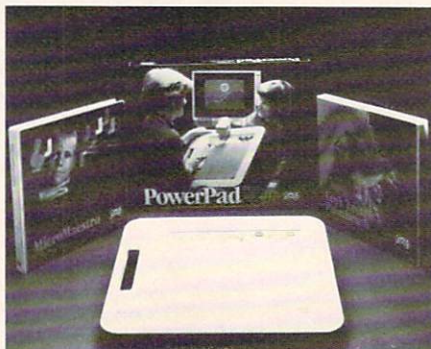
MISCELLANEOUS

Chalk Board PowerPad

MANUFACTURER: Chalk Board, Inc., 3772 Pleasantville Rd., Atlanta, GA 30340
PRICE: \$99

The PowerPad, a 12-by-12-inch touch-sensitive input device, differs from other similar products in two ways. It can sense a "touch" at more than one point; and it has a larger active surface. Its multicontact technology means that you can play musical chords, instead of just single notes. You can also use the pad as a paint "canvas," and watch your drawing show up on the computer screen.

The PowerPad interfaces with the Commodore 64, VIC-20, Apple II plus and IIe, Atari computers, and the IBM PC. Touch (or graphics) tablets will not function without software, which usually must be bought separately. *Leo's Lectric Paintbrush*,

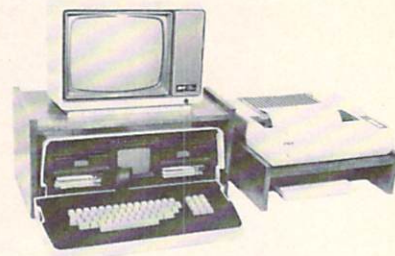


MicroMaker, and *PowerPad Programming* are among the six currently available programs, whose prices range from \$25 to \$50. Chalkboard has ambitious plans for a collection of software called "Leonardo's Library." It will consist of 30 plug-in cartridge or disk packages, covering topic areas such as art, music, language arts, social studies, science, and math.

Hardwood Stands

MANUFACTURER: Woodtec, 320 W. Maple, Box 445, Arkansas City, KS 67005; (316) 442-7000
PRICE: \$39 and up

Woodtec has stands for both printers and monitors, which are designed in several sizes to fit both normal and wide-carriage printers, and different computer heights. The stands are constructed with furniture glue, and finished with hardwood veneer and stain. Prices start



at \$38.95 for a 16½-inch-wide stand, designed for Epson-size printers.

Miracle Matrix

MANUFACTURER: Ordi-Flex Inc., 2180 Belgrave, Montreal, Canada H4A 2L8; (514) 483-4144
PRICE: \$10-88, depending on size and model


One of the most common problems computer users encounter is eye-strain, the result of light or sunlight glare on CRT screens. Among the filters designed to overcome this problem is the Ordi-Flex Miracle Matrix, which is made of nylon micro-mono-filament. The fine-net mesh of the screen cuts down on glare, making characters easier to read, but it may require added care, to prevent against punctures and dust buildup.

Mosaic Adapter and Memory Boards

MANUFACTURER: Mosaic Electronics, P.O. Box 708, Oregon City, OR 97045; (503) 653-7885
PRICE: \$59 (Adapter); \$79 (Standard 16 Memory Board); \$109 (Rammaster 16 Memory Board)

For people who bought the Atari 800 with 16K, and then added two 16K memory boards to expand to 48K, Mosaic Electronics has released an adapter to free up one of the slots. The two 16K RAM chips are merely taken out of their slots and put on the adapter, which fits into one slot. Thus, there is an open slot for other peripherals, such as an 80-column board. Picture instructions are included with the adapter.

For VIC-20 owners looking to expand their memory, Mosaic offers two 16K expansion boards. The Rammaster 16 features a built-in expansion port for cartridges and other memory boards. The Standard 16 is a basic 16K memory board. Both boards come with a four-year guarantee and an owner's manual.

For more information and to find the nearest Mosaic dealer, call (800) 547-2807. 



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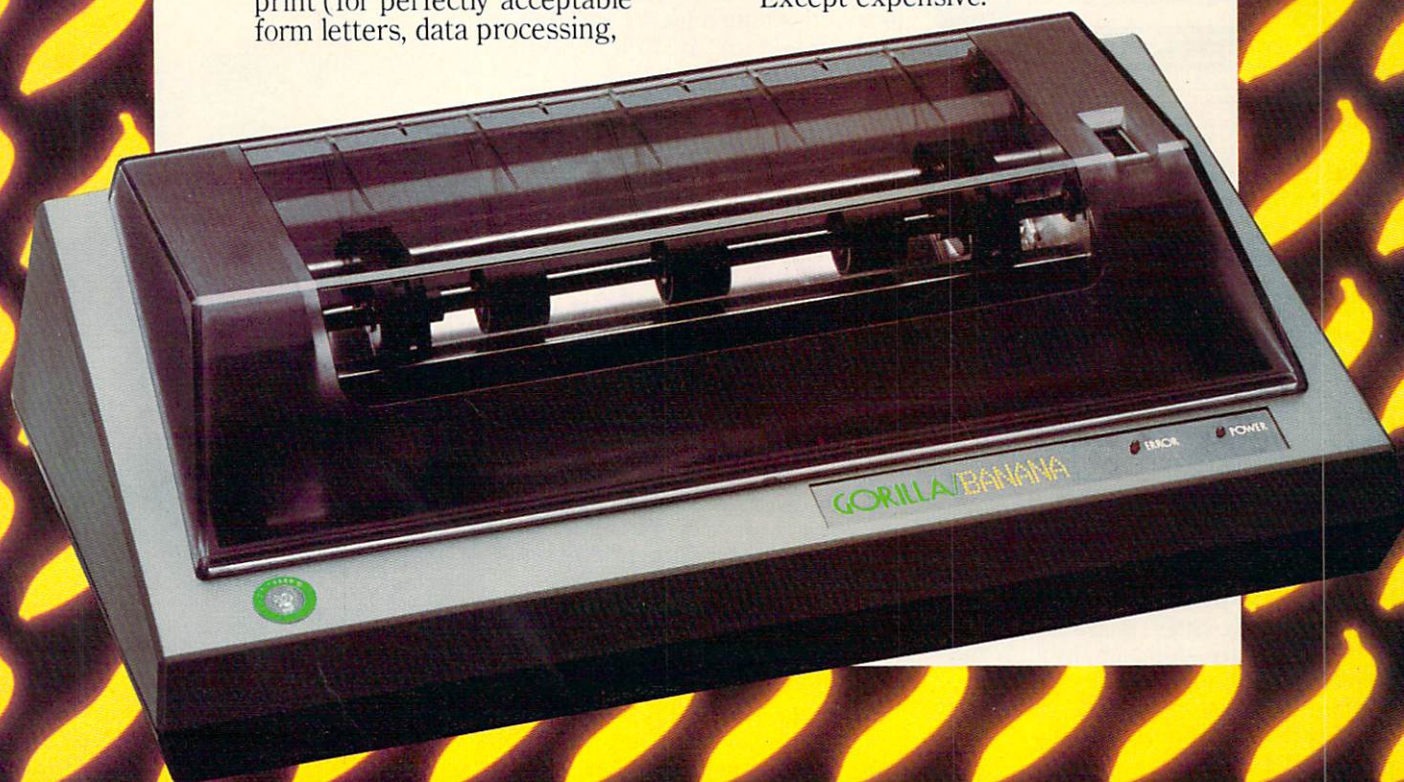
After that, it's merely comparable to other printers that can cost up to three times as much: 10" carriages (to handle standard 9½" paper), 80 columns, graphics capability, 10 characters per inch (expandable to 5 cpi) draft-quality print (for perfectly acceptable form letters, data processing,

business reports, etc.) tractor feed (for precise alignment and quick loading), parallel or serial interface (take your pick), self-inking ribbon cassette (for long life and easy installation), 10 portable pounds in weight, and compatibility with so many of the most popular personal computers on the market.

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WHAT'S IN STORE



THE COLOR OF THINGS TO COME

Technology marches on at a rapid, sometimes bewildering pace. Who would have thought that a coloring book could be the answer to keeping up? Full-page illustrations, taken from sources such as schematic diagrams, X-rays, and satellite photos, illustrate the many facets of the latest developments in computer science, space exploration, medical research, and the like. Color the images by number and read the accompanying explanations to gain a better feel for the futuristic world of today. Recommended for inquisitive ages, 10 and up, the *New Technology Coloring Book* by Rita Aero and Howard Rheingold is published by Bantam books and is available at many book and computer stores for \$6.95.

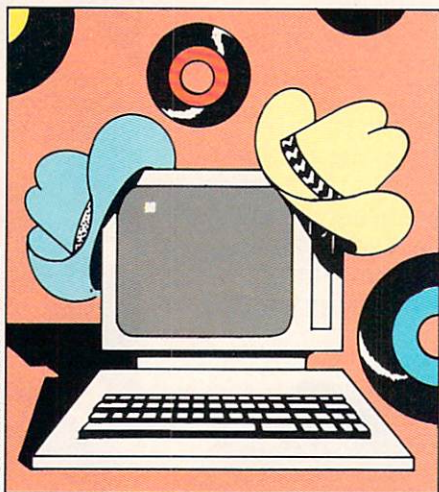
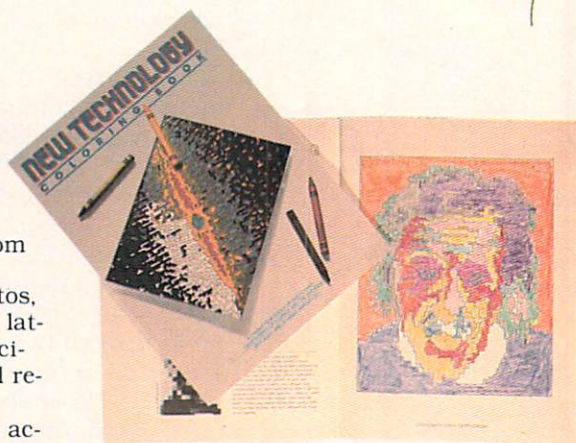


ILLUSTRATION BY ROBERT CONRAD

SINGING ABOUT BITS, BYTES, AND THE BLUES

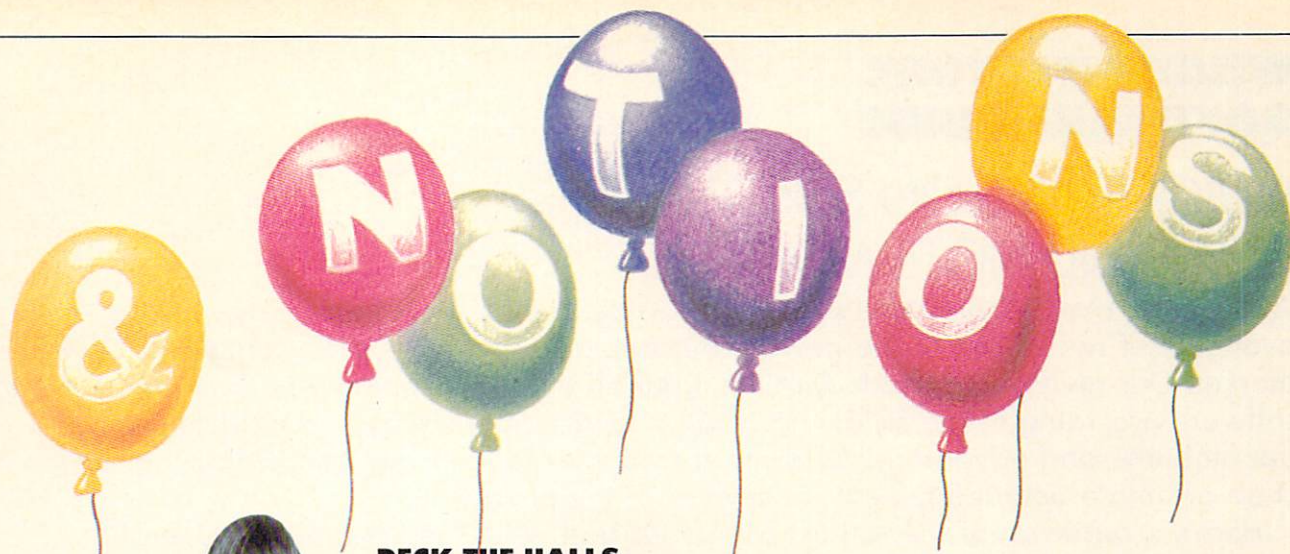
The woes of computer widowhood are poignantly chronicled in a snappy country-pop tune entitled "BASIC Ain't the Language of Love." Composed by Felicia Scherer and performed entirely by Florida-based country-western recording artists Steve and Debbie Brown, this song is bound to strike a chord among those who've wrestled with the difficulties of being on-line and in love. It describes how a couple manages to make the course of true love run smooth again by balancing out their devotion to ROM and romance. The entertaining single is available at select computer stores or through the record company, for \$5, postpaid from Reymont Associates, P.O. Box 273271, Boca Raton, FL 33427; (305) 483-4343.

A GIFT FOR THE DISK-BEARER

Carry floppies to work, school, or a friend's house in these functional bags with style, to boot. Insert a couple of pieces of cardboard in these 7-by-8 inch rubber tread pouches to protect your precious disks from crumpling or folding. The bags are available in red, olive, black, and clear vinyl, with a variety of different colored straps. They retail for a suggested \$8 to \$10 at department stores such as Bloomingdale's, Macy's, Dayton's, and Jacobson's, or at the Unique Clothing Warehouse in New York City; or order them directly from the manufacturer: Walker Products, 110 Capp St., San Francisco, CA 94110; (415) 863-2839.



PHOTOGRAPHS BY WILLIAM GALLAGHER; MODEL: MEGAN VAN FEELES



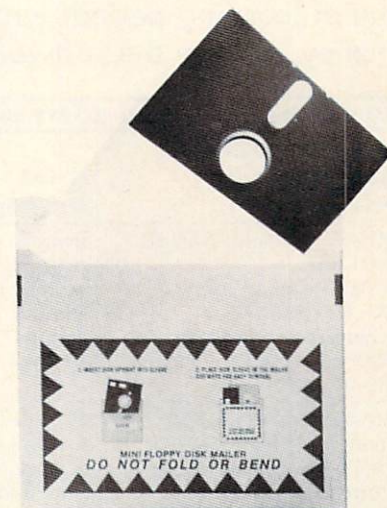
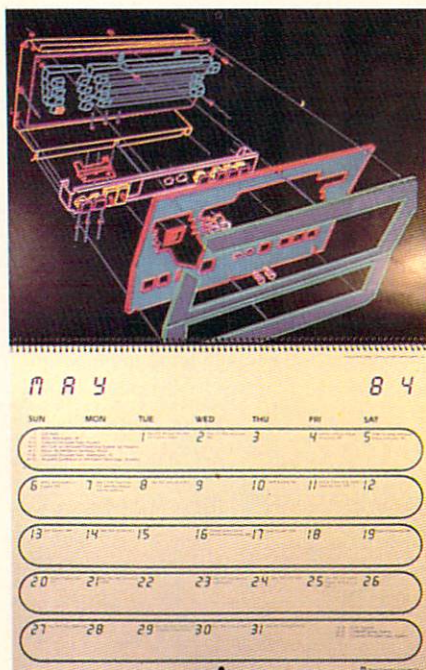
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1984!

1984's here, and to make sure that you map out your year in keeping with the future, there is the 1984 Great Computer Calendar. Featuring 13 brilliant full-color reproductions of computer art and computer-aided design, the calendar includes day-by-day listings of some of the most significant dates in the history of computers and computer development. The 1984 Great Computer Calendar is available at many bookstores and computer stores for \$7.95. Or order it directly from Reston Publishing Company, 11480 Sunset Hills Rd., Reston, VA 22090; (800) 336-0338.



A POUCH OF PREVENTION

Fragile floppy disk plus sloppy postal system often equals disaster for the disk user relying on the mails. Happily, the Kangaroo Floppy Disk Mailer will help minimize the risk of disks woefully crushed, manhandled, or otherwise mangled by mailpersons. Preprinted instructions advise about the use of the pouch and caution handlers to the sensitive nature of its contents. Extra-stiff packaging helps ward off tragedies such as the doubled disk, and a soft inner lining prevents disk abrasion. Packets for 5½- or 8-inch disks come with a permanent adhesive sealing flap and hold up to five disks each. Available at many stationery and computer stores, \$17.75 for a package of 25, or about 70 cents each.

WHAT'S IN STORE SOFTWARE GUIDE

QUICK TAKES ON SOFTWARE— NEW AND NOTEWORTHY

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Following the chart are more detailed reviews of several of the programs.

Here's a rundown of the ratings categories and what they mean: **●** = Overall performance, and refers to the software's performance given the limitations and capacities of the particular computer for which it is intended; **D** = Documentation, or the instructions and literature that accompany a program; **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users; **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities; **EU** = Ease of use after the initial learning period, which varies from computer to computer; **V** = Value for money, or how the software measures up to its price.

HOME BUSINESS AND HOME MANAGEMENT

| Title Manufacturer Price | Brief Description | Hardware/ Equipment Required | Backup Policy | Ratings | | | | | |
|---|--|---|--|-------------|-------------|-------------|-----|----|-------------|
| | | | | O | D | EH | GQ | EU | V |
| HOME FILING MANAGER Atari, Inc. 1312 Crossman Ave. P.O. Box 61657 Sunnyvale, CA 94086 (800) 538-8543 \$49.95 ©1982 | Data-base management program, simulating card file, stores and retrieves information. Simple, straightforward commands make it easy to apply to most home organizational tasks.† | Atari 400/800/1200, 32K (disk) | Defective disks replaced free. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | n/a | E | ★ ★ ★ |
| HOUSEHOLD FINANCE Creative Software 230 E. Caribbean Dr. Sunnyvale, CA 94089 (408) 745-1655 \$19.95 ©1982 | Families already organized, looking for a way to keep track of budgeted and actual expenses, may find this helpful. Cassette version is rather cumbersome. | Commodore VIC-20 (cassette); also available for Commodore 64 (disk or cassette); Atari 400/800/1200, 16K (cassette), 32K (disk) | Defective material replaced free. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | n/a | D | ★ ★ ★ |
| THE IRA PLANNER Timex Computer Corp. P.O. Box 2655 Waterbury, CT 06725 (800) 248-4639 \$15.95 ©1982 | User inputs data on inflation rate, periodic savings and expenditure, and the program helps forecast retirement finances and the status of long-term investments.† | TS 1000, 16K (cassette) | Defective cassettes replaced free w/ in 90 days. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | n/a | E | ★ ★ ★ |
| LOAN ANALYZER Creative Software 230 E. Caribbean Dr. Sunnyvale, CA 94089 (408) 745-1655 \$14.95 ©1981 | Determines periodic payments on loans. May help home-business Realtors or car dealers, etc. but it's little more than a duplicate of the first program taught in intro BASIC class. | Commodore VIC-20 (cassette); also available for Commodore 64 (disk or cassette); Atari 400/800/1200, 16K (cassette), 32K (disk) | Defective material replaced free. | ★ ★ | ★ ★ | ★ ★ | n/a | E | ★ |
| PRACTICALC 64 Computer Software Associates/Micro Software 44 Oak St. The Silk Mill Newton Upper Falls, MA 02164 (617) 527-7510 \$49.95 (cassette) \$54.95 (disk) ©1983 | Valuable spreadsheet program helps map out budgets, chart investments, by simulating ledger page. Changes in variables result in automatic recalculation of data. Perfect for small businesses; may be overkill for simple household needs.† | Commodore 64 (disk or cassette) | Defective material replaced free; backup copy available for \$5. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | n/a | A | ★ ★ ★ |

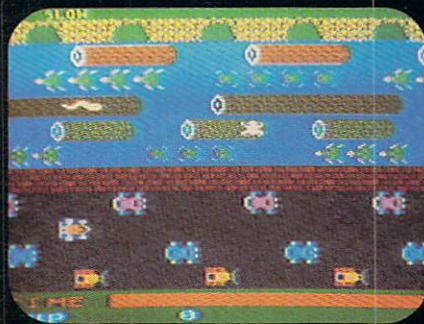
RATINGS KEY ● Overall performance; **D** Documentation; **EH** Error handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart



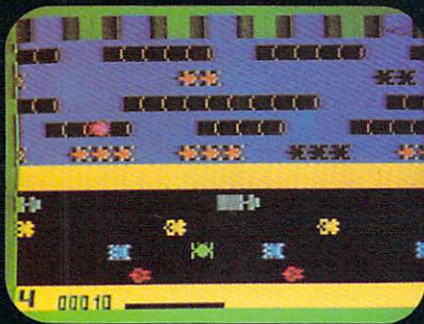
ATARI 5200



TI 99/4A



ATARI 400/800/600XL



INTELLIVISION



COMMODORE VIC 20



ATARI 2600



COMMODORE 64



COLECOVISION

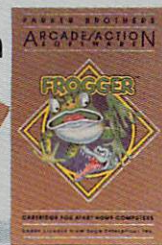
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PARKER BROTHERS

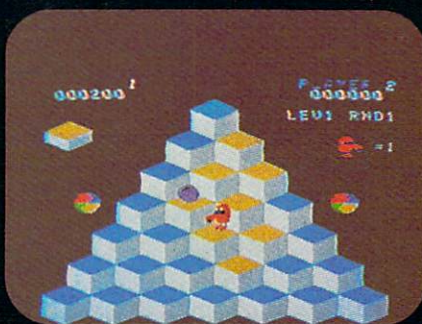


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| GAMES | | | | | | | | | |
|--|--|---|---|-------------|-------------|-------------|---------------|-------------|-------------|
| Title Manufacturer Price | Brief Description | Hardware/ Equipment Required | Backup Policy | Ratings | | | | | |
| | | | | O | D | EH | GQ | EU | V |
| ALPINE Texas Instruments P.O. Box 53 Lubbock, TX 79408 (806) 796-3201 \$24.95 ©1982 | Climb mountains while avoiding cliff-dwelling animals and hazards such as icefalls and rockslides in this enjoyable skill/arcade diversion good for ages 4+. | TI-99/4A (cartridge); joysticks and speech synthesizer recommended | Defective cartridges replaced free w/ in 90 days; \$10 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E ★ ★ | ★ ★ ★ |
| CRITICAL MASS Sirius Software 10364 Rockingham Dr. Sacramento, CA 95827 (916) 366-1195 \$39.95 ©1983 | Save the world from terrorists holding civilization for ransom. Gripping text adventure has time limit that requires players, ages 14+, to think out commands carefully.† | Apple II/II plus/IIe, 48K (disk) | Defective or user-damaged disks replaced free w/in 30 days; \$5 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A ★ ★ | ★ ★ ★ |
| DEATH IN THE CARIBBEAN Micro Fun 2699 Skokie Valley Rd. Highland Park, IL 60035 (312) 433-7550 \$35 ©1983 | Retrieve treasure and escape from tropical island in colorfully packaged text/graphics adventure with serious drawbacks—limited vocabulary, inconsistent command response, and clumsy save/restore function. | Apple II/II plus/IIe, 48K (disk); also available for Atari 400/800/1200, 32K (disk); Commodore 64 (disk); IBM PC, 64K (disk) | Defective or user-damaged disks replaced free w/in 30 days; \$5 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D ★ ★ | ★ ★ ★ |
| RIVER RAID Activision 2350 Bayshore Frontage Rd. Mountain View, CA 94043 (415) 960-0410 \$34.95 ©1983 | Pilot attack jet up an endless river, destroying enemy ships, copters, and bridges. Exciting, challenging skill/arcade game has colorful graphics and easy-to-master play system. | Atari 400/800/1200, 16K (cartridge) | Defective cartridges replaced free w/ in 1 year. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A ★ ★ | ★ ★ ★ |
| THE ROAD TO GETTYSBURG Strategic Simulations 883 Stierlin Rd. Bldg. A-200 Mountain View, CA 94043 (415) 964-1353 \$59.95 ©1981 | As the commander of the Confederate or Union forces, you maneuver units into combat in strategic simulation of historic Civil War battle. War game includes innovations that contribute to realistic re-creation of combat.† | Apple II/II plus/IIe/III w/ emulator, 48K (disk) | Defective or user-damaged disks replaced free w/in 30 days; \$10 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D ★ ★ | ★ ★ ★ |
| ST. NICK Funware 230 E. Caribbean Dr. Sunnyvale, CA 94086 (408) 745-1655 \$44.95 ©1983 | Help Santa select from Xmas goodies while being pursued by two witches. Complex <i>Pac-Man</i> variation proved too difficult for inexperienced and younger players. | TI-99/4A (cartridge); joysticks optional | Defective cartridges replaced free w/ in 90 days. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | D ★ ★ | ★ ★ ★ |
| SWORD OF FARGOAL Epyx 1043 Kiel Ct. Sunnyvale, CA 94089 (408) 745-0700 \$40 ©1982 | Journey through 20 levels of a dungeon in search of magical sword. Battle assortment of creatures in simple adventure game ideal for newcomers and one-sitting play.† | VIC-20, 16K (cassette); also available for Commodore 64 (disk or cassette); joysticks required | Defective material replaced free w/ in 30 days; \$10 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A ★ ★ | ★ ★ ★ |
| TEMPLE OF APSHAI Epyx 1043 Kiel Ct. Sunnyvale, CA 94089 (408) 745-0700 \$40 ©1981 | Guide preprogrammed explorer or hero of your own creation through dungeon halls. Keep track of fatigue levels while searching for treasure. Adventure has arcade elements and cute, primitive graphics.† | Apple II/II plus/IIe, 48K (disk); also available for Atari 400/800/1200, 16K (cartridge), 32K (disk); Commodore 64 (disk or cassette)/VIC-20, 16K (cartridge); IBM PC, 64K (disk) | Defective material replaced free w/ in 30 days; \$10 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A ★ ★ | ★ ★ ★ |
| ULYSSES AND THE GOLDEN FLEECE Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 \$32.95 ©1982 | As the great Ulysses, gather stalwart crew and set sail in search of the golden fleece, avoiding legendary perils and solving puzzles in exciting, rewarding text/graphics adventure. Great for ages 8+. | Apple II/II plus/IIe, 48K (disk); also available for Atari 400/800/1200, 32K (disk); IBM PC, 64K (disk) | Defective or user-damaged material replaced free w/ in 90 days; \$5 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A ★ ★ | ★ ★ ★ |
| ZORK II Infocom 55 Wheeler St. Cambridge, MA 02138 (617) 492-1031 \$49.95 (Com. 64) \$40 (all others) ©1982 | Voyage through the underground empire in clever mapmaking and puzzle-solving game. A favorite with confirmed gamers, it has limited appeal for general audiences because imagination must supply all visuals. | Apple II/II plus/IIe, 48K (disk); also available for Atari 400/800/1200, 32K (disk); Commodore 64 (disk); IBM PC, 64K (disk); TRS-80 I/III, 32K (disk) | Defective or user-damaged disks replaced w/in 90 days; \$15 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | n/a ★ ★ | D ★ ★ | ★ ★ ★ |
| RATINGS KEY O Overall performance; D Documentation; EH Error handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart | | | | | | | | | |



ATARI 5200



TI99/4A



ATARI 400/800/600XL



INTELLIVISION



COMMODORE VIC 20



ATARI 2600

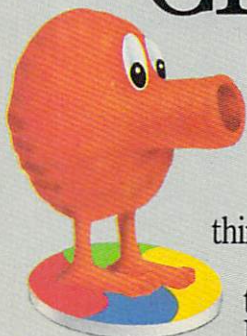


COMMODORE 64



COLECOVISION

HOW TO GET Q*BERT™ OUT OF YOUR SYSTEM.



If you've been wanting to play Q*bert, but haven't been able to find it available for your home system, your time has come. Because now you can keep things hopping with any of these popular home video and computer formats.

Get going to your nearest video store and get Q*bert today. And while you're there, check out Parker Brothers' POPEYE®, FROGGER™, TUTANKHAM™, and SUPER COBRA™. All the great Arcade Action®

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WHAT'S IN STORE SOFTWARE GUIDE

EDUCATION/FUN LEARNING

| Title Manufacturer Price | Brief Description | Hardware/ Equipment Required | Backup Policy | Ratings | | | | | | |
|---|--|---|---|------------------|------------------|------------------|------------------|----|---|---|
| | | | | O | D | EH | GQ | EU | V | |
| CREATURE CREATOR DesignWare 185 Berry St. Bldg. 3, Suite 158 San Francisco, CA 94107 (415) 546-1866 \$39.95 ©1983 | Kids ages 4-8 enjoy creating a creature from a variety of body parts, then making it move and dance. They may learn about the computer, preprogramming skills, and pattern recognition. Program has cute, but unexceptional graphics. | Apple II plus/Ile, 48K (disk); also available for Atari 400/800/1200, 48K (disk); IBM PC, 64K (disk) | Defective disks replaced free; backup copy available for \$12. | ★ ★ | ★ ★ | ★ ★ | ★ ★ | E | ★ | ★ |
| DRAGON'S KEEP Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 \$29.95 ©1983 | Simple introduction to adventures for ages 7+, will teach kids fundamentals of mapmaking as they attempt to locate and release animals captured by a dragon.† | Apple II/I plus/Ile, 48K (disk) | Defective disks replaced free w/ in 90 days; \$5 fee thereafter. | ★ ★ | ★ ★ | ★ ★ | ★ ★ | E | ★ | ★ |
| IN SEARCH OF THE MOST AMAZING THING Spinnaker Software 215 First Ave. Cambridge, MA 02142 (617) 868-4700 \$39.95 ©1982 | Novel adventure-like program will teach kids, ages 10+ about dealing with different people, cultures, and customs, while searching for clues to the whereabouts of the Most Amazing Thing.† | Apple II/I plus/Ile, 48K (disk); also available for Atari 400/800/1200, 48K (disk); Commodore 64 (disk); IBM PC, 64K (disk); IBM requires color card | Defective or user-damaged disks replaced free w/in 30 days; \$5 fee thereafter. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | A | ★ | ★ |
| KINDERCOMP Spinnaker Software 215 First Ave. Cambridge, MA 02142 (617) 868-4700 \$39.95 (cartridge) \$29.95 (disk) ©1983 | Prereading, premath, and pattern-recognition games and activities introduce 3-8-year-olds to computer keyboard.† | Commodore 64 (disk or cartridge); also available for Apple II/I plus/Ile, 48K (disk); Atari 400/800/1200, 32K (disk), 16K (cartridge); IBM PC, 64K (disk) | Defective or user-damaged material replaced free w/ in 30 days; \$5 fee thereafter. | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | E | ★ | ★ |
| MICROBE: THE ANATOMICAL ADVENTURE Synergistic Software 830 N. Riverside Dr. Suite 201 Renton, WA 98055 (206) 226-3216 \$44.95 ©1982 | Younger kids may need help, but teens and adults will learn all about human anatomy and medicine as they travel toward the brain of an injured patient to treat the source of one of several illnesses, while fending off attacking immune systems.† | Apple II/I plus/Ile, 48K (disk) | Defective disks replaced free w/ in 30 days; \$5 fee if user-damaged. | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | ★ ★ ★ ★ | D | ★ | ★ |
| SAMMY THE SEA SERPENT Program Design, Inc. 95 E. Putnam Ave. Greenwich, CT 06830 (203) 661-8799 \$18.95 (cassette) \$23.95 (disk) ©1982 | Game and read-along recorded storybook familiarizes pre-schoolers with joystick handling and computer as they try to help Sammy to the safety of his quiet ocean home.† | Atari 400/800/1200, 16K (cassette), 24K (disk); Atari cassette player and joystick required | Defective material replaced free; \$5 fee if user damaged. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | E | ★ | ★ |
| SPRITEMASTER 64 Access Software 925 E. 900 S. Salt Lake City, UT 84105 (801) 532-1134 \$35.95 ©1982 | Utilities program helps non-programmers create exciting animation while exploiting Commodore's excellent graphics capabilities and learning more about internals of the computer. | Commodore 64 (disk or cassette); joysticks optional | Defective disks replaced free w/ in 90 days; user makes backup copy. | ★ ★ ★ | ★ ★ ★ | ★ ★ ★ | n/a | A | ★ | ★ |
| TROLL'S TALE Sierra On-Line Sierra On-Line Bldg. Coarsegold, CA 93614 (209) 683-6858 \$29.95 ©1983 | Mapping and reasoning skills may rub off on kids age 8+, as they roam throughout the countryside searching for loot the troll has stashed away in this intro to adventure games with clever graphics.† | Apple II/I plus/Ile, 48K (disk) | Defective disks replaced free w/ in 90 days; \$5 fee thereafter. | ★ ★ | ★ ★ | ★ ★ | ★ ★ | E | ★ | ★ |
| YOUR VIC-20 Wizware/Scholastic 730 Broadway New York, NY 10003 (212) 505-3000 \$39.95 ©1983 | Good idea for introduction to graphics, workings, and capabilities of the VIC-20. Flawed by cassette's inherently long loading time. Users will find program tedious and frustrating. | Commodore VIC-20 (cassette) | Defective cassettes replaced free w/ in 90 days; \$5 fee thereafter. | ★ | ★ | ★ ★ | ★ ★ | E | ★ | ★ |

RATINGS KEY O Overall performance; D Documentation; EH Error handling; GQ Graphics quality; EU Ease of use; V Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★★ Excellent; n/a Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart



ATARI 5200



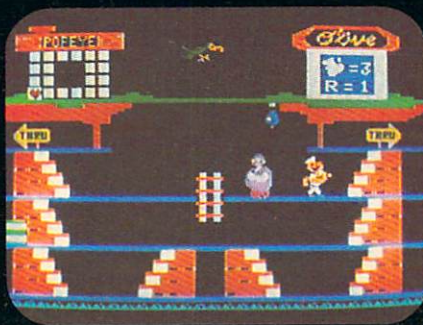
ATARI 400



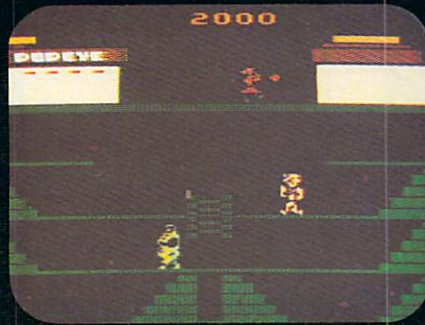
ATARI 800



ATARI 600XL



TI99/4A



ATARI 2600



INTELLIVISION



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EVERYONE HAS THEIR OWN SYSTEM FOR PLAYING POPEYE.®



Atari.® Intellivision.® ColecoVision.™ T.I.™ Now you can play POPEYE, one of the most fun and challenging arcade games yet, on any one of them. Run through three screens of non-stop action, where you try to capture Olive Oyl's heart while avoiding untold dangers, including Brutus and the Sea Hag.

Run down to your local store for Popeye today.

And while you're there, check out TUTANKHAM,™ FROGGER,™ Q*bert™ and SUPER COBRA,™ also from Parker Brothers' Arcade Action Series.

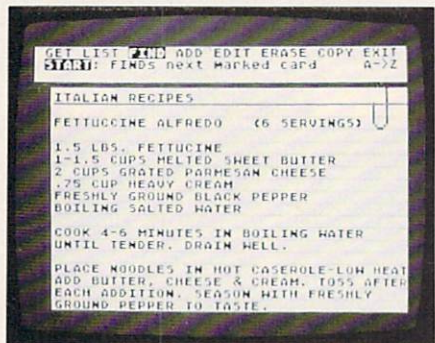


WHAT'S IN STORE SOFTWARE REVIEWS

HOME BUSINESS & HOME MANAGEMENT

The Home Filing Manager

HARDWARE REQUIREMENTS: Atari
400/800/1200, 32K (disk)
MANUFACTURER: Atari
PRICE: \$49.95



After the initial novelty of owning a computer wears off, most people start to search for the really useful purposes their computers can serve. Word processing and the storage and retrieval of information are two of the most practical computer applications. Atari owners should definitely consider *The Home Filing Manager* as a useful data-base management program with which to perform the last of these two important functions.

It is simple and straightforward enough for almost any computer novice. If you are starting fresh, you are asked whether you wish to format a new disk on which you can store your information. A more complete menu will help you start entering, editing, and searching through your new computer file right away. Select an option from a list that appears at the top of your screen. Commands such as GET, LIST, FIND, ADD, COPY, EXIT, are all explicit and easy to use.

The information you store will appear in a file-card format. You have room for 18 lines and 37 characters per line. You can type in any kind of information, anywhere on the "card," in any format. Data typed on the top line, the title line, will be the basis for future sorting of your files.

I started out by designing a mailing list program for Christmas cards. It was simple to set up a format that resembled a typed label. The manual, which is very clear and concise, warned me that the number of cards I could use depended on the amount of information I put on each card. There was enough room so

that I didn't even fill one disk. One drawback for my purposes was that I was unable to store additional information on the cards without having the entire card, non-address information and all, printed out. You print out either the top line or the entire card.

I finished the mailing list and formatted another disk for a recipe program for my wife. The same program helps me keep track of my credit cards, furniture inventory (for insurance purposes), and appliance records. I especially appreciate the feature that allows you to search for cards labeled with certain phrases, such as ITALIAN RECIPES, and then marks the cards found with a paper clip, for automatic, sequential retrieval at a later time. You may search through your data, or review it in alphabetical or reverse-alphabetical order. And once you've located a card, you can print, edit, or erase it easily.

All these features combine to make *The Home Filing Manager* a terrific program to enhance the usefulness of your Atari home computer. Its potential application in the home, and even in small businesses is practically limitless.

—ROBERT W. JACKSON

The IRA Planner

HARDWARE REQUIREMENTS: TS 1000,
16K (cassette)
MANUFACTURER: Timex Computer
Corp.
PRICE: \$15.95

Start with \$200, add \$20 a month—how much will you have in 25 years, assuming nine percent interest compounded quarterly? If that kind of retirement planning and forecasting throws you for a loop, what are you going to do about all the other variables? For instance: what will that sum be worth in terms of buying power, considering inflation? How long will you be able to draw on the account if you take \$300 a month?

With *IRA Planner*, you can input the amounts you want to save and ask for the rest of the information. Or, you can work backwards: If you want to draw \$300 a month starting in 1997, how much do you have to start putting away now?

IRA Planner may seem like a magician when it starts to juggle all your figures, but it is not a soothsayer. You'll have to predict and enter interest rates for the years, as well as the expected inflation rate.

You must do a reasonable amount of research in order to make the best use of this program.

Even the best research won't give you definite answers when it comes to the economy, but you can ask the computer to run through the figures with different interest/inflation variables to help you make some decisions. The program will even tell you the tax savings resulting from your various tax-deferred plans.

The IRA Planner is a good program with a few extra features you may not even need. The documentation is reasonably clear. Overall, the program's thoroughness comes as a pleasant surprise to someone like myself, who is all too familiar with the poor quality of much of the software available for the TS 1000.

—SHARON AKER

PractiCalc 64

HARDWARE REQUIREMENTS: Commodore 64, (disk or cassette)
MANUFACTURER: Computer Software Associates
PRICE: \$54.95 (disk); \$49.95 (cassette)

There's no doubt that *PractiCalc* was designed initially for business use. That doesn't mean it doesn't have its share of home applications. Using it just for home applications would probably be a case of overkill. But it's an ideal program for the combination computer—the home computer used for business purposes on the side (or vice versa).

PractiCalc is a spreadsheet program, and like its high-powered relatives for the Apple, IBM PC, Atari, and TRS-80 computers, it's perfect for manipulating rows and columns of numbers. For me, the program handled a home record-keeping problem that other budget-management programs had never quite been able to manage: our savings account. It's always been strictly an in-today, out-tomorrow affair. I use it as a sort of treasury for expenses that don't come up every month—car and life insurance, heating oil, firewood, Christmas shopping. Keeping track of each little account got ridiculous. With *PractiCalc*, I was able to sort things out in no time. I now keep track of monthly balances as well as a running total.

My husband made even better use of *PractiCalc*'s features by recording his students' grades with it. Interim grades (for warning notices!), marking period and yearly averages, high-



INSTEAD OF SAVING FOR YOUR KID'S EDUCATION, MAYBE YOU SHOULD BE SPENDING FOR IT.

We'd be the first to encourage parents to save for their kids' education. But money alone isn't enough to get anybody into college. Let alone through it.

At more and more colleges today, computer skills are becoming mandatory. And at some colleges, those skills are required for admission itself.

But with saving for tuition and room and board, who has money for computers? One answer is the Commodore 64.TM

The Commodore 64 gives you a powerful 64K memory. That's as much memory as either the Apple® IIe or the new IBM® Personal Computer. But at far less than half the cost.

You also get full-color graphics, a nine-scale music synthesizer, and a wide range of software.

The Commodore 64 interfaces with all the peripherals you could want for total personal computing: disk drives, printers, and a telephone modem that's less than \$100.

The combination of power, graphics, music, and software makes it the perfect computer for a student to start out with. And stay with right through college.

And beyond.

commodore
COMPUTERS

In more homes than any other home computer.



WHAT'S IN STORE SOFTWARE REVIEWS

est and lowest grades, class averages—all shuffled, sorted, and printed out in next to no time.

The program's main drawback is the lack of a catalog option, an option that would enable the user to keep track of the different files on each data disk. Because there is no main directory, careful labeling of your records is a must.

It performs calculations rapidly; it will automatically recalculate the contents of a "cell" (the intersection of a vertical column and a horizontal row) if you've changed data used in original calculations. The program also includes valuable options for on-screen or on-paper bar graphs and charts.

With *PractiCalc* you can put the main features to use immediately while you familiarize yourself with the fancier ones. Its instruction manual is clear and thorough. But be prepared to do a fair amount of studying and practicing if you want to get the most out of its many sophisticated capabilities. —SHARON AKER

EDUCATION/ FUN LEARNING

Dragon's Keep and Troll's Tale

HARDWARE REQUIREMENTS: Apple II/II plus/Ile, 48K (disk)

MANUFACTURER: Sierra On-Line

PRICE: \$29.95 each



Sierra On-Line has established quite a reputation for itself as a maker of exciting, innovative text-adventure games. *Dragon's Keep* and *Troll's Tale* are two recent additions to their new "learning game" series which borrow elements from the adventure/discovery genre. In *Dragon's Keep*, kids age seven and up must locate captured animals and set them free; in *Troll's Tale*, players age eight and up collect various treasures which the troll has captured from King Mark. Each game re-

quires kids to explore several locations, only 16 of which contain the hidden animals or treasures.

Kids find these programs entertaining—at least for a while. One young enthusiast remarked, "Once you start to play, it's hard to stop." Because the playing instructions are explicit, and because only two keys (the space bar and RETURN key) are used, even very young children can explore these fanciful worlds, provided that they can read.

Large maps that come with each game are supposed to help kids progress along the routes to discovery. In *Dragon's Keep*, the map indicates all locations and routes. In *Troll's*



Tale, the map is a bit sketchier; many of the locations are unidentified, and some of the routes in between are not shown. As you explore the Troll's world you must label locations and fill in the paths between them. If your child retrieves a treasure or releases one of the animals, he or she can use a peel-off label to stick onto the map and identify the proper location.

Some kids complain that the map in *Dragon's Keep* is confusing and unclear. Several routes were omitted entirely from the map—the paths between the school and the front of the house or the field and the zoo, for instance. Map-making and map-building are two skills that these packages claim to promote, so these are important objections.

It may be frustrating to some kids to find that they must start each game from the very beginning, because of the lack of a save option. Also, each package contains only one map. The locations of treasures and animals don't vary from game to game. And marking the map with the pretty stickers provided ruins the mystery for subsequent players.

Still, the games are quite colorful and fascinating for younger children. As for their educational merit,

they do help teach the notion of up, down, right, and left. The package claims that the "skill focus" is on such things as "identifying details" and "making inferences," but the actual educational value of these games is limited—probably not much more than any other computer adventure game (and less than many of them). Better these two be regarded as simple introductions to fantasy adventures for young children, and leave it at that.

—TONY MORRIS

In Search of the Most Amazing Thing

HARDWARE REQUIREMENTS: Apple II/II plus/Ile, 48K (disk); also available for Atari 400/800/1200, 48K (disk); Commodore 64 (disk); IBM PC, 64K (disk); IBM requires color card
MANUFACTURER: Spinnaker
PRICE: \$39.95

You're in a hot air balloon, drifting along at 5,000 feet above the Gifleez region of a land called Darksome Mire, in search of something they call the Most Amazing Thing. Uncle Smoke Bailey, who once discovered the Thing, but dropped it somewhere in Darksome Mire, has given you many important tips.

In the Gifleez huts below, traders will exchange your money for their currency and sell you more clues about the Thing's whereabouts. So you land and your balloon becomes a dune buggy. On your way to the huts, you must refuel. Drill for oil beside a night rock and munch on berries from a popberry tree for nourishment. Beware of the mire crab which scuttles into view unexpectedly! You can evade him with some fancy dune buggy navigation.

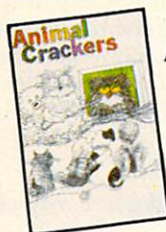
Arriving at one of the Gifleez huts you are greeted by a trader and asked to soothe him with a bit of music. Previously you learned that the Gifleez prefer simple music, so you play him the tune you've already composed with the hot air balloon's computer. Pay the trader for additional information regarding the mysterious Most Amazing Thing and continue your journey into a neighboring culture.

Your search will take many hours of such traveling and trading, collecting information and avoiding perils. Fortunately, you can save your game to disk, stop for dinner or a breather, and come back later to resume your journey. In the course

Kids climb to the top in our playground...

For the
Atari 400/800™
and Commodore 64™

Because we offer more than just educational games. Our unique software brings the magic touch of the **Edumate Light Pen™** together with the amazing computer voice of **S.A.M.™**, the Software Automatic Mouth, so children can interact directly with our teaching programs. **Playground Software™** makes learning and learning to use the computer child's play!



Animal Crackers™

Preschool
to Grade 3

Our playground of active, colorful animals will have your child spelling new words in no time at all. **Animal Crackers™** combines the use of the **Edumate Light Pen™** and children's fascination with animals and computers to teach your children the alphabet as they learn to spell. By simply touching a letter on the screen with the **Edumate Light Pen™**, your children will create a screen full of animals and other playful objects. Not only is it fun, it's educational!



Unleash the creative talents of the big kids and the little kids in your family with the first electronic coloring book. **Computer Crayons™** comes complete with ready-to-paint scenes and an artist's palette of vibrant color. Additional options permit you to save and restore pictures easily, draw circles, lines, boxes, and erase in a single stroke.

Let your imagination run wild with the Sketch Pad that allows you to create your own video paintings from scratch.

Now anyone can transform our **Edumate Light Pen™** into an electronic paint brush with **Computer Crayons™**!

Computer Crayons™

For Kids of
All Ages



Alphabet Arcade™

Preschool
to Grade 1

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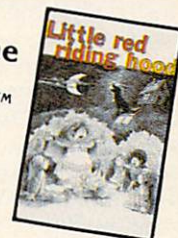
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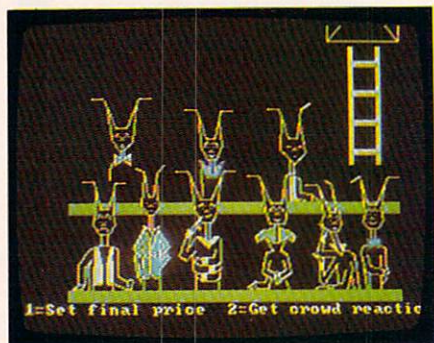
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of your travels you'll learn that different cultures have different customs that you must respect if you are to succeed and retrieve the treasured Thing.



You'll learn about coordinates and map-reading, and how to take advantage of winds that will whisk your balloon great distances without using up fuel. But, perhaps most important, as one young voyager said, "You learn how to learn from other people—it's like real life."

Unfortunately, this potentially outstanding learning game has a number of serious flaws. The instruction book, for instance, is incomplete, so you must learn practically everything by trial-and-error. Each of my play testers grew frustrated at the lack of basic instructions. One child spent hours preparing for his first journey and lost everything when he found that you must occasionally sleep when your vehicle is on the ground. Nowhere is this mentioned in the instructions; much to his chagrin, he perished and had to begin again.

Also, the adventure takes hours and hours to play. Younger children may tire quickly of the quest. But even older kids become disenchanted since the action is very slow and tedious. For example, every time you visit Uncle Smoke for information, you must go through an elaborate series of greetings in order to solicit advice. After all this, Smoke gives you just one object, which you must then auction off for money for supplies and equipment. It's not unusual to spend up to three or four hours just accumulating enough chips to adequately prepare for your very first journey. These drawbacks are important considerations indeed. For how can software that claims to be educational and fun educate if it can't hold young users' attention?

—TONY MORRIS

Kindercomp

HARDWARE REQUIREMENTS: Commodore 64 (disk or cartridge); also available for Apple II/II plus/IIe, 48K (disk); Atari 400/800/1200, 16K (cartridge), 32K (disk); IBM PC, 64K (disk)
MANUFACTURER: Spinnaker
PRICE: \$29.95 (disk); \$39.95 (cartridge)

We first ran *Kindercomp* for our three-and-a-half-year-old just before his bedtime. It was a big mistake, for Nicholas' "just once more's kept him up for more than an hour and a half. Consider a now typical scenario in our family room: Nicholas is playing *Kindercomp* at the Commodore 64; his 16-month-old brother finds a spare joystick and climbs up beside him, in the hopes that he, too, can have a try at controlling the fascinating sights and sounds on the screen. A friend from the neighborhood is bound to drop by, to play "that game" that is so famous. (Our visitors are likely to be anywhere from five to nine.) And, I admit it, I do like the draw option myself.

Kindercomp starts with a menu listing the options by number. This may pose a problem for some preschoolers, but Nicholas had them all down pat by the end of the second day. Some of the activities are purely fun and fascinating to watch. Your child types his or her name, for instance, and, presto, it's dancing all over the screen, in a variety of patterns and colors. Other activities are simple educational games that cover prereading and math skills—pattern matching and sequence exercises. Exercises and activities are accompanied by interesting, appropriately brief tunes.

The games automatically provide a correct answer after the child's second mistake. And, in the Commo-



dore version, with each correct response, one more piece is added to one of three pictures—a face, a boat, or a hot air balloon. When the pic-

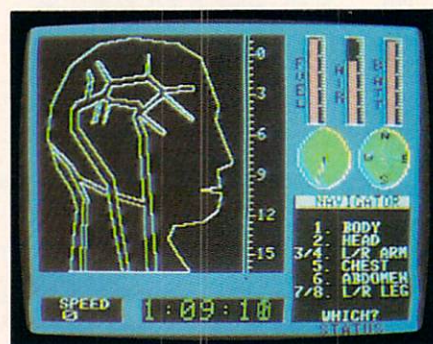
ture is complete, the face winks, the boat sails away, or the hot air balloon takes off.

Kids find *Kindercomp* fascinating, while the eight and older crowd might tire of it after several complete run-throughs. But it's one of the first programs I show to friends when I'm trying to convince them just how much fun a computer can be for very young children.

—SHARON AKER

Microbe: The Anatomical Adventure

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk)
MANUFACTURER: Synergistic Software
PRICE: \$44.95



The year is 1991. Thanks to the newest technology, a submarine and its crew can be reduced to microscopic size and injected into the human body in order to treat otherwise inoperable brain damage. As the commander of one of these microscopic medical subs, your mission is to voyage through the body of one of several different patients to treat the damage before time runs out.

Having selected a case from among 10 options, you are given an extensive medical history of the patient, a description of how the injury occurred, a set of symptoms, and information as to the nature and location of the brain damage. At your disposal is a skilled crew that includes a navigator, a technician, and a physician. Your ship is also furnished with a library with information about immune defenses and microorganisms.

There are a variety of cases and casualties from which to choose. Bubba Rockefeller, for instance, "sustained massive head injuries" when a small object on the road caused him to lose control of his motorcycle. As commander of the medical microsub your mission would be to

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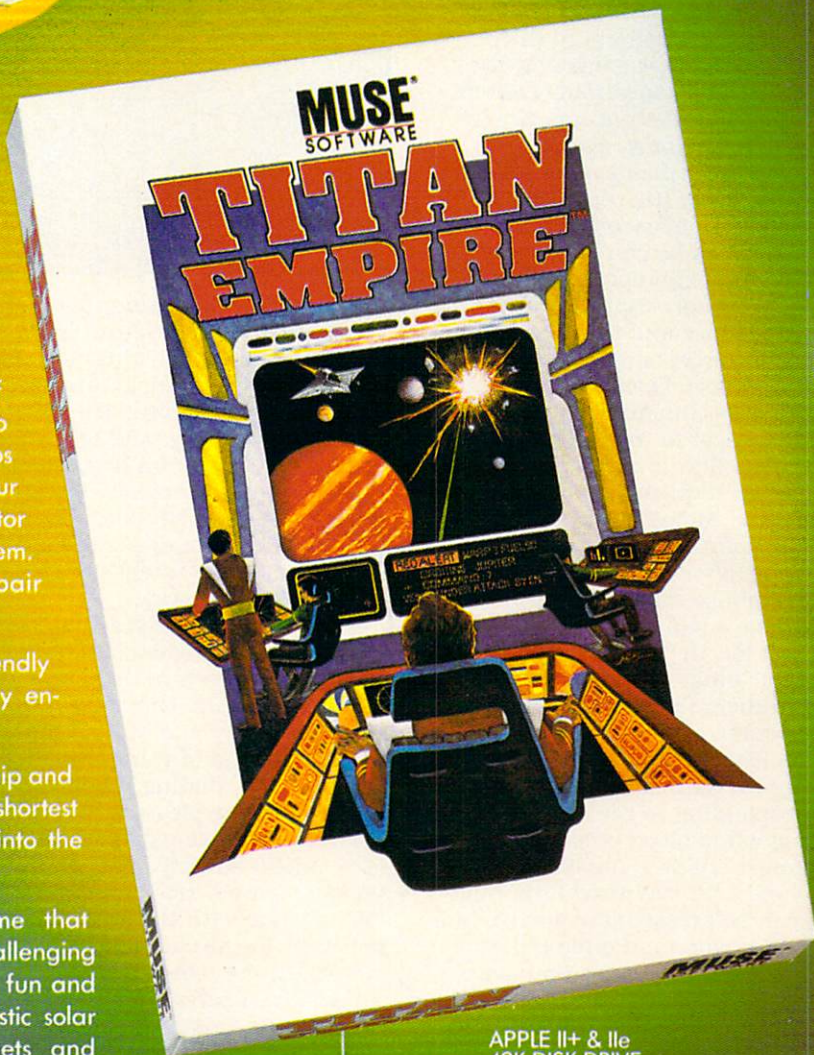
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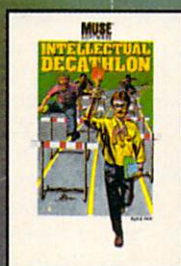
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travel to the superior cortex and destroy the hemorrhage there before Bubba died of a stroke.

Traveling through the body, dodging white and red blood cells without hitting the surrounding artery walls, fighting off attacking immune systems while treating emergencies such as shock or massive hemorrhage—all are activities as challenging as any I've experienced in conventional computer games. At the same time, the educational content of the package is stunning. Knowledge about anatomy, allergies, drugs, medical emergencies—these are but a few of the educational by-products of this fascinating game.

At first *Microbe* can be intimidating (the thorough documentation amounts to more than 50 pages!), but persistence and practice pay off. It becomes increasingly easier and more enjoyable. One precocious young player announced to me, "When you get to the heart, you have to fibrillate first to stop it from beating and then quickly go through and defibrillate. Almost always I have to use epinephrine, lidocaine, and bicarbonate after defibrillating in order to stabilize the patient. And I never take a patient who smokes or drinks a lot; their blood is strange and their lungs have all kinds of stuff in them that makes it hard to get through." He held forth as his fingers flew over the keyboard, controlling the submarine, refuelling, and responding to the attacks of oncoming white blood cells.

Younger children are likely to find the game a bit overwhelming, but they can be pressed into service in a party of explorers. (Perhaps they could specialize as mission navigators or technicians.) Teenagers and adults with the least bit of scientific or medical curiosity and enough persistence to make it through the initial learning stages will find this program an unbeatable combination of learning and fun. —TONY MORRIS

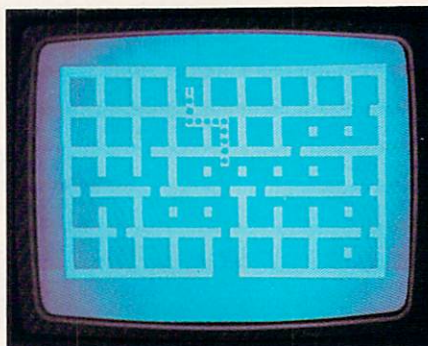
Sammy the Sea Serpent

HARDWARE REQUIREMENTS: Atari 400/800/1200, 16K (cassette), 24K (disk); cassette required for both disk and cassette versions

MANUFACTURER: Program Design
PRICE: \$23.95 (disk); \$18.95 (cassette)

Sammy the Sea Serpent's parents have gone away for the day and left him at home to catch bugs. A storm

blows up and a big wave washes poor Sammy away. As the story tape narrates the tale, your child must use the joystick to help Sammy through several adventures and return to his ocean home.



The package has two programs. The first one, the adventures of Sammy, reminds me of those "read-along books" that are accompanied by a cassette or record. The tape tells Sammy's story, and tells your child how to help him home. The second program consists of two games, one in which players steer Sammy through a maze, the other, in which Sammy catches bugs before they skitter away.

My four-and-a-half-year-old daughter really enjoys read-along books. She's almost worn out several story tapes of her own. Therefore, I consider her pretty much of an authority on this kind of thing. She liked *Sammy* a lot, finding it enjoyable not only for the pleasant story but also for the active part she had to take to help Sammy get back home safe and sound. Her hand grew tired after a while with the joystick. But I remedied the situation by taping the joystick to the table.

I've known several families who have bought this program along with their first home computer. Although intended for kids age four to seven, *Sammy* will grow stale rather quickly for children who are older or who have a great deal of computer experience. They'll master the games and tire of the story. Parents of three-to-five-year-olds, however, will find this a wonderful way of introducing their kids to the computer and joystick.

One word of warning: neither the cassette nor the disk versions of this program will operate without an Atari cassette player. Even if you have a disk drive, you'll need the cassette to play the program.

—DEAN VAN DE CARR

GAMES

Critical Mass

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk)

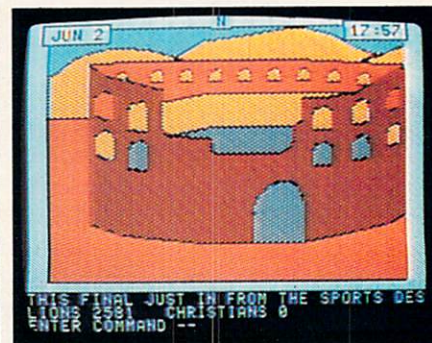
MANUFACTURER: Sirius Software

PRICE: \$39.95

Here's a text adventure with a twist. Because there's a time limit to the action, you must think through each of your moves while mapping out your progress and keeping track of dead ends and worthless turns. Don't waste any time backtracking; otherwise, time will run out. Terrorists holding civilization at ransom will detonate their atom bomb, and blow the world to smithereens.

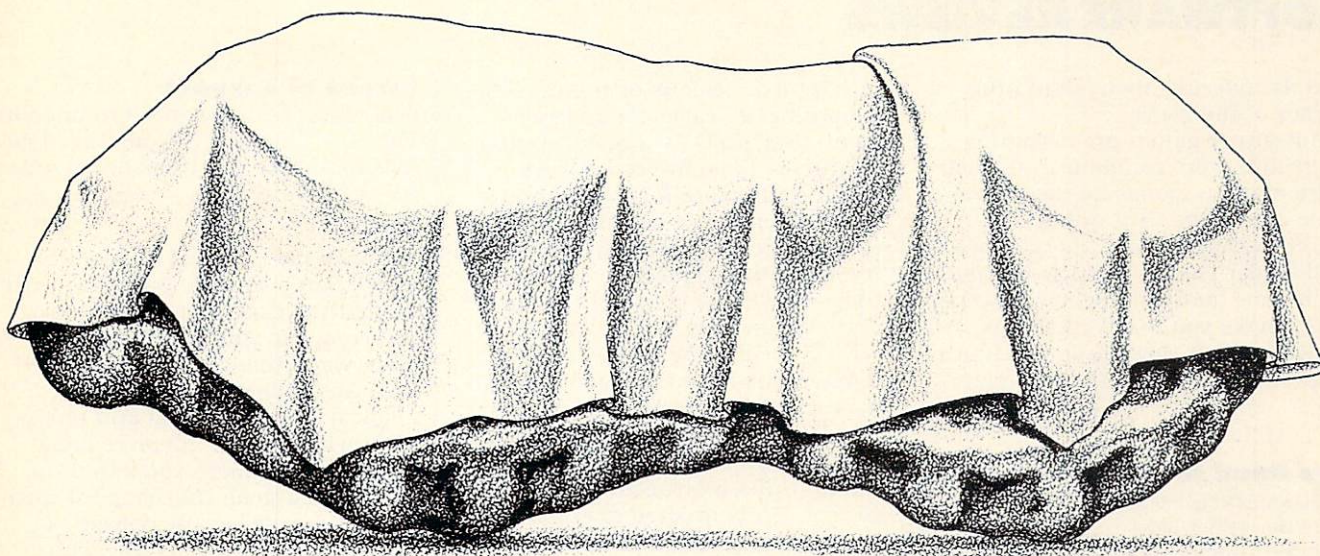
You can save the world if you're brave, clever, fast, and if you possess that devil-may-care attitude toward risk taking and life (at least the make-believe life one leads in an adventure game) that makes heroes out of us all.

Your mission begins in New York City and takes you around the world, to European capitals and tropical islands. In your search for clues to help prevent the world's destruction, you'll encounter a variety of obstacles—falling elevators, flooding Parisian sewers, and deadly contagious diseases, to name a few. It's quite a package for the price, and easy enough for those who have



wanted to try their hand at text adventures but have been intimidated by their complexity.

Players ages 14 and up are able to play the game alone. They find it less frustrating, more enjoyable, and ultimately more believable than other Sirius programs such as *Kabul Spy*, *Escape from Rungistan*, or *The Blade of Blackpoole*. The time limitation lends an authentic sense of urgency to the proceedings. Players take longer to reason through each option before typing in commands. This results in more thinking and



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less floundering about than other games of the genre.

Adventure games are becoming more and more common in the software market, alongside the skill/arcade diversions. But unlike the purely escapist shoot-'em-ups, chase and ladder games, and the infinite variations on those themes, adventures make you use your brains, which is what these little machines were intended for in the first place.

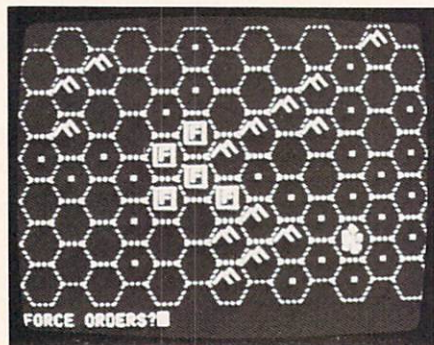
—JAMES DELSON

The Road to Gettysburg

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk)

MANUFACTURER: Strategic Simulations
PRICE \$59.95

In June 1863, the Army of Northern Virginia, led by the South's most able commander, General Robert E. Lee, invaded Pennsylvania, taking the Civil War to the heart of the Union, north of Washington, D.C. Under General George Meade, the federal forces moved out from their defensive shield around Washington and Baltimore and headed toward Lee's reported position. Quite by accident these two huge armies, totaling more than 160,000 men, bumped into each other near the town of Gettysburg, where Lee's men had intended to raid a shoe factory. The subsequent battle, probably the most famous ever waged on American soil, was a startling defeat for Lee, and he never again attempted to take the war to the North.



One of the chief factors contributing to Lee's defeat at Gettysburg, and one of the main problems encountered by field commanders throughout the ages, has been the critical issue of command control. Since leaders can't give direct orders to all of their troops, they must dispatch written instructions. Frequently these orders are lost or misunderstood. Messages are

intercepted. Jealous or ingratiating subordinates, eager for advancement, overreact. As a result, units instructed to go five miles west might sit in place for several hours while the message becomes outdated. Designers of computer and non-computer war games have never come up with an adequate method of recreating this "fog of war."

Now, the designers at Strategic Simulations have managed to incorporate this important element into *The Road to Gettysburg*. Players type in orders that are never received. Units instructed to go south go east. Units ordered to stand retreat. It's mayhem, and that's why it's so good. It is the closest approximation to the craziness that characterizes the movement and command structure of large armies.

And that's just the beginning of the good news about this superb program. Movement, combat, and other sorts of orders are written by the player into "dispatches" that the computer "delivers" (or doesn't) in subsequent turns, depending on the distance between the commander and his units. All movement is secret, until opponents are close enough to face off with one another. Even then, subordinate commanders, all controlled by the computer, can only approximate the size of the opponent.

The Road to Gettysburg's drawbacks mirror those of the other computerized war games. The action is cramped. Each of only 11 pieces per side represent 5,000 to 8,000 soldiers. Moreover, the game takes at least 12 hours to play in its entirety, and that's only after run-throughs of several trial games to become accustomed to the complex play system. The command control system is also frustrating—even for the best war gamers. Most of us are used to having total control over gaming pieces, moving markers or units around by hand. No wonder we scream at the computer for "misdirecting" pieces on purpose. ("Lost Orders," indeed!)

This is not a program for beginners. You should have some background in other computer war games, chess, or strategy games before giving it a try. But for those willing to face the challenges and the same sort of frustrations that real generals have to live with (or die because of), *The Road to Gettysburg* is an excellent simulation of the great campaign.

—JAMES DELSON

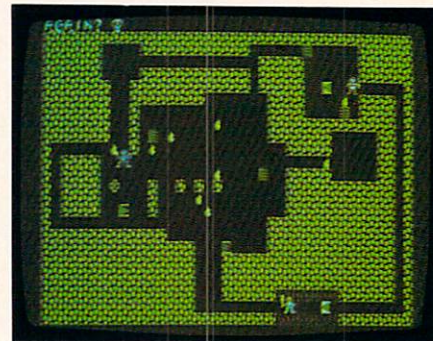
Sword of Fargoal

HARDWARE REQUIREMENTS: Commodore VIC-20, 16K (cassette); also available for Commodore 64 (disk or cassette)

MANUFACTURER: Epyx

PRICE: \$40

You may have started out as little more than a country bumpkin with no fighting experience, but before you complete your quest through the 20 levels of this dungeon, you will learn to battle dragons and cast magical spells that heal and render you invisible. And, if you're lucky and skilled enough, you'll find the sword of Fargoal, that magical weapon that can defeat the powers of darkness. To find your way, you must walk through every foot of the dungeon, so mark well the temples



of sanctuary (where you are granted experience points, healed at twice the ordinary rate, and sometimes made invisible to attacking monsters). Use your spells sparingly. Where you're going, they are few and far between.

The computer muse must have smiled on Jeff McCord, the designer of this program. McCord has created an ideal introduction to adventure gaming. It features just the right amount of excitement, not too heavy a dosage of fright for small children; a clever mapping system that reveals the staircases, monsters, traps, and treasures before you actually encounter them; and a simple, but absorbing play system that will intrigue and invite newcomers into the joys of questing.

Other adventure games, such as the *Apshai* series and *Wizardry*, require many, many hours of play before one can feel at ease, and many more after that to play through to completion. *Fargoal*, on the other hand, is intended to be played in one sitting. Newcomers may fail to accomplish the task at hand, which is to seek out and retrieve the magic sword and escape the multileveled

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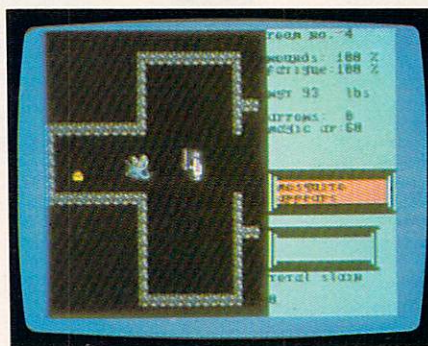
dungeon within a preprogrammed 33 minutes, but most will enjoy playing just for the fun of it. Quests can last up to nine hours.

The one major drawback to the game, both in VIC-20 and Commodore 64 versions, is the complete lack of a save system. If you've spent five hours fighting your way down to the sixteenth level and suddenly find yourself robbed of spells by a mage (not mentioned in the documentation), then get killed by an assassin, you've blown your chances for success. Most adventure games feature a save option that allows you to leave the game and resume at a later sitting. Such a feature also enables you to restore the program to a level you achieved and saved earlier. This does away with the hassle of having to fight your way through the levels you've already conquered. The game certainly isn't ruined by the lack of this option. It just makes success more elusive. Maybe that's what makes this such a great introduction to adventure gaming. Patience is an attribute no adventure gamer can do without. —JAMES DELSON

Temple of Apshai

HARDWARE REQUIREMENTS: Atari 400/800/1200, 16K (cartridge), 32K (disk); also available for Apple II/II plus/IIe, 48K (disk); Commodore 64 (disk or cassette)/VIC-20, 16K (cartridge); IBM PC, 64K (disk)

MANUFACTURER: Epyx
PRICE: \$40



A good sense of timing is just as important as being able to keep track of and map your route through the variety of dungeon levels in the treasure-rich *Temple of Apshai*. You have to know when to physically square off against the monsters blocking your path, when to fire arrows at them, and when to run away from the meanies inhabiting the dark corridors, dank cells, and hidden recesses of this maze. Guide a

preprogrammed explorer, or a hero of your own creation through the halls of the dungeon displayed from an overhead perspective. Keep track of his physical condition, his wound and fatigue levels. If he has suffered too many blows, he may have to return to the inn, replenish his supplies and strength, deposit the treasures he's accumulated, and race back to resume his hunt.

Apshai is an adventure game with more to offer than simple puzzle solving and dragon slaying. For example, an innovative fatigue feature drains your hero of energy as you guide him through search and combat, or when he carries heavy loads of treasure. Exertion of too much energy makes him vulnerable to subsequent attacks, regardless of his experience level. Also, you must assign an intelligence level to your character. The more intelligent your hero, the more success he'll have in bargaining for arms, armor, and other provisions he'll need for his quest. Given a high IQ he'll be able to beat offers down. A low IQ means he'll have to pay top prices or lose out in bargaining altogether.

Players ages 12 and up catch on quickly to *Apshai*. But even younger children get quite involved with a little help from parents or older friends. The command/control system is not great. Delays in movement and combat have caused more than one would-be hero to bite the dust before realizing just how long it takes for the computer to respond to player commands. The graphics are unsophisticated, but cute.

If you play it safe, *Apshai* can be quite an experience, one which you'll find yourself going back to regularly.

—JAMES DELSON

Ulysses and the Golden Fleece

HARDWARE REQUIREMENTS: Apple II/II plus/IIe, 48K (disk); also available for Atari 400/800/1200, 32K (disk); IBM PC, 64K (disk)

MANUFACTURER: Sierra On-Line
PRICE: \$32.95

Superheros come and go. But few have reputations to match that of Ulysses, the Greek hero of *The Iliad* and *The Odyssey* whose powers of reasoning were as great as his fighting prowess. He was the one who devised the Trojan Horse scheme, figured out how to escape from the nasty one-eyed Cyclops, and even

outwitted Poseidon, god of the seas. Game designers Ken Williams and Bob Davis have recast Ulysses in the role of another legendary character—Jason, leader of the Argonauts—in the famous quest for the Golden Fleece. As the great Ulysses himself, you must gather a crew of stalwart companions, obtain a ship and supplies, and sail off to high adventure.



On your travels you'll encounter obstacles and foes drawn from a variety of Greek myths. You'll have to solve puzzles of graduating degrees of complexity. Read cryptic messages and maps, decipher instructions to build your own wings. (Hint: Pluck the giant condor first.) Figure out how to survive the seductive songs of the sirens.

Players may occasionally find themselves extraordinarily frustrated, stumped by puzzles with no apparent resolution. But unlike *Death in the Caribbean*, which isn't fun or fascinating enough to merit the time it takes to play, *Ulysses* repays with pleasure all the head-scratching puzzle solving.

Players ages eight and up will find this game intriguing and consistently entertaining. Long sought-after solutions to particularly challenging situations, such as building the wings or evading the sirens, are often met with applause. A bit of text or graphic adventure experience will be helpful for first-time *Ulysses* players; and those who know something of Greek mythology will find themselves at an advantage. Also, novices will be encouraged along the first several legs of the journey, because, unlike many other adventures, no serious harm befalls the hero until later on in the quest.

Though lacking the classic stature of greats like *Zork* or *Wizardry*, *Ulysses* will give experienced and beginning players alike hours of delightful and cunning fun.

—JAMES DELSON



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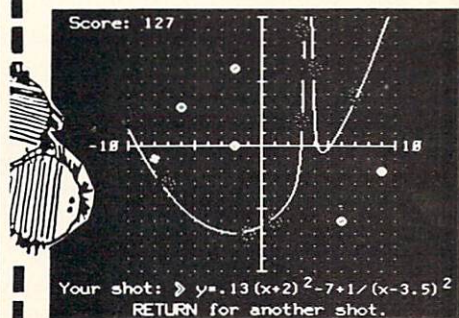
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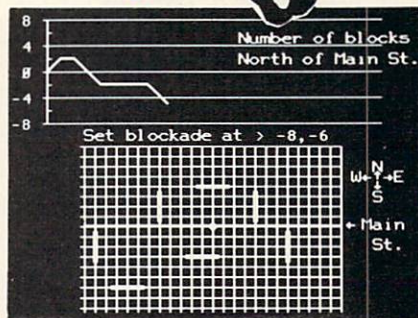


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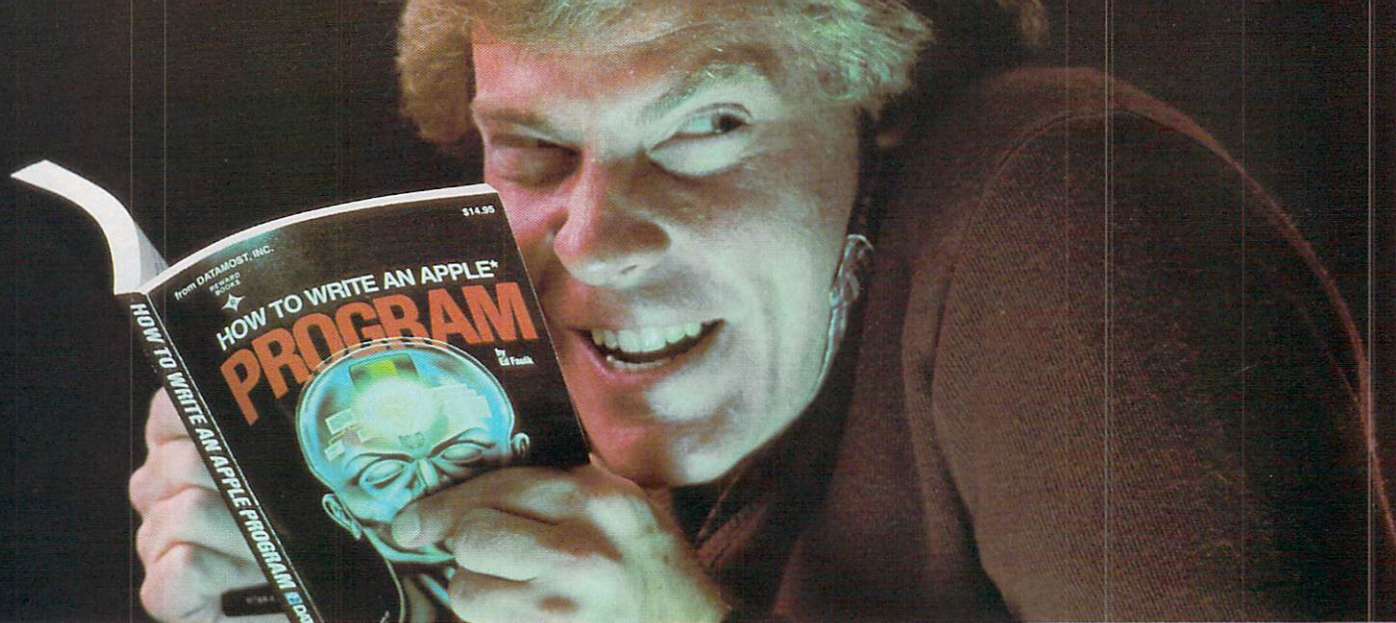


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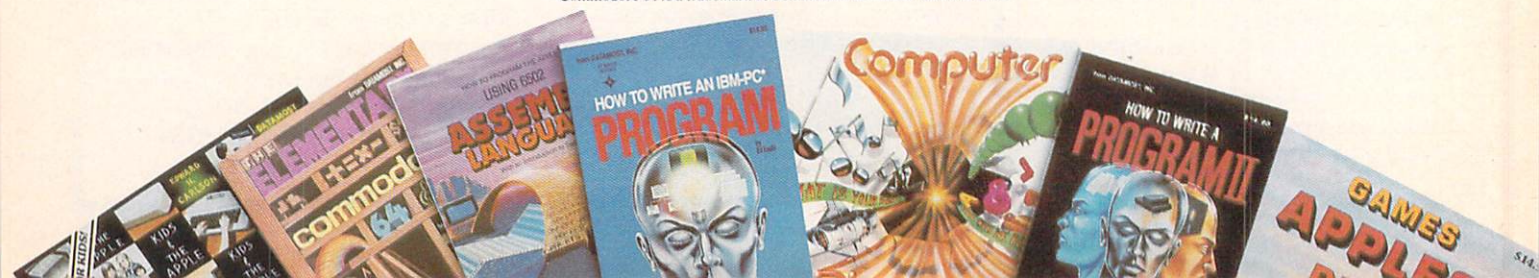
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WHAT'S IN STORE BOOK REVIEWS

The Computer Careers Handbook

Connie Winkler
Arco Publishing, Inc., 1983
142 pp., softcover, \$7.95

Systems analysts, training specialists, data communications experts, EDP auditors . . . there are as many different titles for computer professionals as there are Eskimo words for snow, and *The Computer Careers Handbook* describes them all. If you've ever read the classified ads for computer professionals and not understood a blessed word except the salary offering, then this book is for you.

Ms. Winkler's ambitious manual tries to conjure up a picture of the kinds of jobs that are available in the data-processing and computer industries, the training they require, and the forecast of opportunities for each. She gives a no-nonsense, statistics-laden account of where the computing jobs are and offers some fairly obvious but essential tips on how women, minorities, and the handicapped can break into the profession.

The book does have many serious flaws and may prove frustrating for the novice trying to choose an entry path. For example, the author defines a data-entry operator as someone who enters data, and a computer operator as someone whose task "involves bringing together the applications software and the data to be worked on by the program." Those definitions don't help anyone unfamiliar with mainframe computers and corporate procedures. Ms. Winkler could have walked us through a few sample "shops" so the jobs we read about might seem more vital, and less mechanical.

In addition, while listing the biggest growth areas in computer occupations, the author neglects to mention sales, training, management, and other computer-related jobs that don't require technical backgrounds.

If you're tired of cute computer literacy books and you're ready to leave the comfort of your home computer to set out for the "big time," this book will be an important reference to the world of the corporate computer. If nothing else, it'll help you understand the mystical vocabulary of the classifieds. Just read it with a bit of caution!

—ROBIN RASKIN

Electronic Life

Michael Crichton
Alfred Knopf, 1983
209 pp., hardcover, \$12.95

The information age, like the sexual revolution, the era of inflation, and every other pseudo-epoch through which we move has inspired a shelf load of survival manuals. Computer "how-to" books are now something of an established genre, and the body has even begun to exhibit the occasional nongeneric offshoot. *Electronic Life*, by Michael Crichton, the author of *The Andromeda Strain*, *The Terminal Man*, and other speculative fiction is, I think,



Electronic Life author Michael Crichton

such a rebellious work. Contrary, in both form and content, to the mass of computer literature, the book seeks, in a rather anarchic way, not to teach us what to do with computers, but how to think about them.

The book has no one single topic. Arranged alphabetically by subject and posing as brief meditations or longer essays, Crichton's chapters discuss themes ranging from computer hardware to paranoia.

Crichton is too good a writer not to thread a single, albeit sometimes faintly heard, argument through all these diatribes. He is against applying restrictions on people's thinking about a technology that is still being defined. Quite correctly, he has perceived that a sort of credibility gap has opened up between potential computer users (i.e., everybody) and the party of materially and ideologically vested spokespeople in industry and academia who are currently our only sources of information about

computers. He views these people as potential Calvinists, self-serving moral arbiters, and fears that computers, like other revolutionary technologies, are quickly being co-opted by a repressive and unimaginative establishment. Much of this exploitation, says Crichton, is being sponsored by apparent friends of the micro movement: popularizers and educators who are attempting to create rigid curricula for learning about the machines. Crichton thinks this state of affairs needs a little stirring up. "Personally," he writes, "I hope that for once in the 20th century, a new technology will stay free. . . . Learn about computers your way, and have all the fun you can."

Crichton is a charismatic writer and well versed in his subject. But his personality shows through more clearly than many of the points he is trying to make. Although this book is sure to be advertised as an introduction to computers, it should not be taken as a "computer literacy" course. Anyone who has sat for six hours in front of a Timex Sinclair already knows more about computers than this book can teach them.

—JOHN JAINSHIGG

Kids and the TI-99/4A

Edward Carlson
Reston Publishing Company, 1982
236 pp., softcover, \$19.95

This is a wonderful book for anyone learning BASIC programming with a cassette-based TI-99/4A microcomputer. An informal style of writing, 33 carefully sequenced lessons, a fun approach to pedagogy, and a binding that lies flat when the book is open all contribute to an enjoyable learning experience.

Author Edward Carlson intended his book for 10-to-14-year-olds. Actually, the book is appropriate for any motivated learner 10 and older, including those already familiar with other versions of BASIC. The format is well suited for self-study as well as classroom use. Each lesson includes notes for the instructor (parent, teacher, or older student), questions to consider while doing the lessons, the lesson itself, and an assignment. Answers to programming assignments are included in an appendix.

The glossary uses very informal, easy-to-understand definitions. Only phrases and words needed in learning TI BASIC are included—nothing

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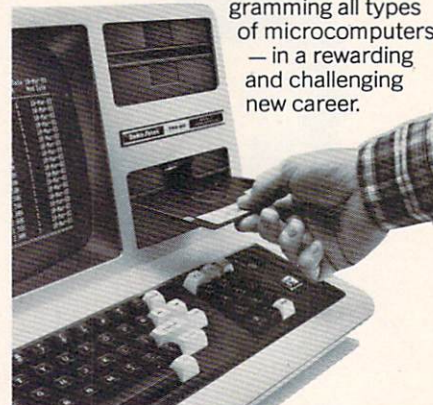
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WHAT'S IN STORE BOOK REVIEWS

extraneous. Readers will learn the meaning of frequently used, but rarely defined, programming terms such as error trap (the "part of a program which checks for mistakes in information that the user has entered"), garbage ("a random mess of characters in memory"), and pixel ("the smallest dot which is placed on the screen in a graphics mode").

Carlson's book teaches a great many new ideas by relating them to experiences already familiar to the reader. His work can provide excellent support for both family and classroom instruction and is also a useful reference for experienced users interested in only a few aspects of TI's unique version of BASIC.

—WALTER KOETKE

What Can I Do with My Timex Sinclair 1000? Lots!

Roger Valentine
John Wiley and Sons, 1983
164 pp., softcover, \$9.95

The title of this book should encourage any frustrated Timex owner. Mr. Valentine has very capably combined the best of two books, *What Can I Do With 1K?*, and *What Can I Do With 16K?*, originally published in England, into a comprehensive book of 56 programs for all user levels. The transition from English to American standards is smoothly accomplished (e.g., pounds to dollars), with typical English humor prevalent throughout the book.

All 56 programs presented are compatible with both the ZX81 and the TS 1000, and each has clear and concise documentation, coupled with memory-saving techniques that can be used by the beginner as well as the user who is into machine-code programming.

Arranged in two sections, 1K and 16K, and in 10 chapters, the programs include fun and games, business applications, printing with frills, graphics, and an interesting and useful chapter of utility programs for Byte Counting, Auto-Run, Machine Code Loader, Line 0, etc.

Much has been written about programs being "user friendly"; I believe this book is "reader friendly"—Mr. Valentine explains each step in a logical and practical manner.

Any one of the 10 chapters could easily be worth the \$9.95 price. At a buck a chapter, it's a real value.

—JAMES ROBERTS

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The slide out software tray has room for 14 cartridges or cassettes and up to 30 diskettes. Most brands of software will fit between the adjustable partitions with a convenient hook for the spare key at rear.

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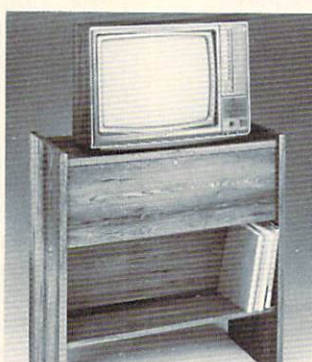
The printer sits behind a fold down door that provides a work surface for papers or books while using the keyboard. The lift up top allows easy access to the top and rear of the printer. A slot in the printer shelf allows for center as well as rear feed printers.

Behind the lower door are a top shelf for paper, feeding the printer, and a bottom shelf to receive printer copy as well as additional storage.

Stand fits same computers as the CS-1632 as well as the Apple I and II, IBM-PC, Franklin and many others.

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THE PRIMER

The Primer will appear in every issue of FAMILY COMPUTING. You might look to it for "Everything You Always Wanted to Know About Computers but Were Afraid to Ask." New information will be presented periodically, and existing sections will continually be adapted and updated. Whatever the format, the Primer is a handy reference guide to shopping for, setting up, and using a computer.

The only way to learn to use a computer is to use one. But before you start, it's well worth asking, "What can I do with a computer?" And, "How does a computer work?"

The illustration of a computer system on the opposite page shows various pieces of equipment, referred to as hardware. To work effectively, this hardware needs step-by-step instructions, or programs. These programs are often called software. What you can do with a computer depends on the software you use.

The many uses of home computers can be broken down into several broad categories.

WHAT A COMPUTER DOES

Game Playing. Several types of games are available—arcade-style action, fantasy, adventure. Some take minutes to master; others months. Many games can be played by more than one person at a time.

Education. Whether you are learning math, French, history, or typing, these programs allow you to learn at your own pace. Programs range from question-and-answer drills to loose creative exercises. Some test logical skills, by putting you in a real-life problem-solving situation; others teach you to program by letting you draw pictures.

Paper work. When it comes to handling reams of information, the computer can't be beat. It functions as an endless supply of paper, file cabinets, and a calculator rolled into one. With an electronic spreadsheet, you can change one figure in a budget and the rest will automatically change. The ability to ask "what if?" and see immediate results has obvious time-saving benefits.

The computer is equally adept at setting up a filing system, and allows you to cross-reference data in any number of ways for easy recall.

With a word-processing program, the computer can speed up and simplify the writing process, by allowing

you to change or rearrange words and paragraphs without retyping.

Information access. You can hook your home computer, via the telephone, to much larger computers at "information service" companies. This allows you to "call up" stock quotations, airline schedules, newspaper and magazine bibliographies, encyclopedias, and even games.

Also, by using the telephone lines you can hook your computer to other home computers around the country, and leave or receive messages. This practice is known as electronic mail. Several computers linked together are called a network.

Programming. It's possible to enjoy practical benefits from your computer without ever buying a commercial program—you can write your own. And, in some cases, you can adapt commercial programs to better suit your particular needs.

HOW A COMPUTER WORKS

The computer is an information-handling machine. It stores, compares, changes, and manipulates information of almost any kind at tremendously high speeds.

The computer's operating method can be boiled down to four simple steps. (1) **INPUT:** Instructions and information, in the form of a program and data, are entered into the computer. (2) **PROCESSING:** The computer executes the steps of the program. (3) **OUTPUT:** The results of the computer's work are made visible and available to the user. (4) **STORAGE:** Results can be stored and saved.

Most home computers do not come ready-made in one piece, but must be assembled from various components. Following are the components needed for each of the four operating steps, and how they work.

Input. There are four basic ways of getting a program and/or other information into a home computer.

KEYBOARD. The keyboard looks and behaves much like that of a type-

writer. Some keyboards have special keys for certain computer functions, and some have a numeric keypad, much like a calculator. But on any unit, every keystroke you type goes directly into the computer's memory. That information will stay there until you delete it or turn the computer off. (You can also store, or save, that information for future use.)

CASSETTE TAPE RECORDER. You can copy a program stored on a cassette tape directly into the computer's memory. Regular tape recorders and cassettes can be used with most home computers, although you will need a special cable to connect the two. Once connected, you merely type a simple command to transfer the program from tape to computer.

DISK DRIVE. The transfer method is much the same with a disk drive, except that the program is stored on a floppy disk, which looks much like a 45 rpm record.

The disk drive enters programs much more quickly and with less chance of error than the cassette recorder. But the cassette recorder is significantly cheaper.

CARTRIDGE. A cartridge, which plugs into a slot built into some computers, also stores programs. Putting a cartridge into a computer actually adds memory to the computer—and that memory contains a program.

Processing. All input goes to the Central Processing Unit (CPU), located underneath the keyboard. The CPU is a maze of tiny electronic circuits, but it functions as a giant.

The CPU controls the flow of information into, out of, and inside the computer. The computer's memory, where information is stored, is located in the CPU. The CPU also interprets a program, performs each of its steps, and then sends the results to the user.

Output. The visible result of a CPU's work is called output. Output is made available on the screen of a

THE COMPONENTS



TV or monitor, or from a printer.

Computers can be hooked to TVs or monitors, and to printers. In all cases special cables are required. In general, the monitor's screen display is sharper than the TV's.

Storage. When the computer is turned on, it will store and remember all information it receives. But when it is turned off, this information will vanish—unless you instruct the computer to save it.

You can store information on a blank tape or disk. Either way, you

can record the results of the computer's work, just as you would record a speech. Then, any time you want to run that program again, you can transfer it into the computer's memory, and see it on the display screen.

You cannot store new information on a cartridge.

Peripherals. Peripherals are optional pieces of equipment that can be added to your computer, but are not crucial to the computer's operation. A printer, in fact, is considered

a peripheral. One of the most popular peripherals is a modem.

MODEM. If you want to link your computer to an information service or other computers, you will need a modem. A modem holds a telephone receiver and transmits and receives data through phone lines.

Remember that the computer is a tool. As with all tools and machines, there is no need to know everything about how a computer works. All you need to know is how to use it for your own purposes.

THE PRIMER

THE WORDS

The Words is a glossary of commonly used computer terms. Some are well-known English words, such as *read* and *write*, that have been incorporated into computer language and given different meanings. (Note: All italicized words in the definitions are defined in full elsewhere in the glossary.) Other terms that refer to a computer's inner workings are not often used in common speech, but are important because they are used in manufacturers' specifications and ads. Don't be awed by them. Remember the delight with which Americans took to the new NASA language over 20 years ago, when John Glenn first orbited the globe.

Access

To retrieve information from a storage place in the computer system. Access time is the amount of time it takes to obtain the information.

Address

A specific location in the computer's *memory* where a piece of information is stored. Each address is identified by a number.

Applications software

Programs that instruct the computer to perform one task or a group of related tasks, such as keeping track of a household budget, or the accounting and inventory of a business.

BASIC

Beginner's All-purpose Symbolic Instruction Code. A popular, easy-to-learn *programming language* widely used with *microcomputers*.

Baud

Bits per second. A unit of measurement that describes the rate at which *data* are transmitted from one device to another, such as computer to *printer*, computer to computer, or computer to *terminal*.

Binary code

A number system using only two digits, "0" and "1." Any number or letter can be expressed as a combination of these digits. Computers use the system by translating each *character* of information into a string of binary numbers.

Bit

The smallest unit of information a computer uses. A bit is either the digit "0" or "1." An "eight bit" processor manipulates *data* in clusters of eight bits.

Board

Printed circuit board. A flat, thin rectangular component of a computer that includes one or more layers of printed circuitry and to which *chips* and other electronic parts are attached. As an add-on to an existing computer, sometimes called a card.

Boot

Derived from "bootstrap." To start or restart a computer system by *reading* instructions from a storage device into the computer's *memory*.

Bug

An error in the logic of a computer *program* that prevents it from running properly. Bugs can cause a program to "freeze up," that is, to repeat the same operation endlessly. Finding and correcting the error is called *debugging*.

Bus

A device that connects components of a computer so that *data* can flow between them. There are several conventional buses that allow components made by different manufacturers to be used in the same computer.

Byte

One byte contains eight *bits*, enough to stand for one *character* of English, or one number. Thus, it generally takes more than one byte to make up a word. "Cat," for instance, requires three bytes.

CAI

Computer Assisted Instruction. A term applied to a wide range of instructional *software*, including drill-and-practice, simulation, and educational games.

Cartridge

A device that stores a prerecorded *program*. A cartridge is inserted into a special slot built into the computer. Also known as a solid state cartridge or ROM module.

Cassette tape recorder

Computer cassette recorders are usually the same as those used for audio recordings, but often need a special cable to connect them to the computer. They house and run magnetic tapes that either hold a prerecorded *program* or store *data* from the computer.

Character

A letter, number, or symbol.

Chip

A small (about the size of a child's fingernail) component that contains a large amount of electronic circuitry. Chips are the building blocks of a computer and perform various functions, such as doing arithmetic, serving as the computer's *memory*, or controlling other chips.

Command

An instruction that tells the computer to do something, such as to run a *program*.

Compatibility

The ability of different devices, such as a computer and a *printer*, to work together; or the ability of a particular *program* to run on a given computer. In short, the ability of anything in a computer system to work with anything else.

CP/M

Control Program for Microprocessors. A widely used *operating system* for microcomputers.

CPU

Central Processing Unit. The "heart" of a *microprocessor*, with components that control the interpretation and execution of instructions.

CRT

Cathode Ray Tube. A TV or TV-like *monitor* used to display information and pictures. Also called a computer screen.

Cursor

A symbol, usually a small square, that indicates where the next *character* will appear on the CRT screen.

Data

Information put into or taken out of a computer.

Data bank

A central location for storing vast amounts of information accessible by computer.

Data-base manager

A *program* that allows the user to enter, organize, sort, and retrieve information.

Disk

A magnetic device for storing information and *programs* accessible by a computer. A disk can be either a rigid platter (hard disk) or a sheet of flexible plastic (floppy diskette). Disks have tracks, much like grooves on LP records, where *data* is stored.

Disk drive

A device that *reads* information from a *disk* and copies it into the computer's *memory* so that it can be used by the computer, and that *writes* information from the computer's *memory* onto a *disk* so that it can be stored.

Documentation

The written instructions that explain how to use computer *hardware* or *software*. Also refers to all instructions and remarks, used to describe procedures when programming.

DOS

Disk Operating System. See *operating system*.

Downtime

Time when a computer is not working.

Electronic mail

The transmission of messages, documents, or other information from one computer user to another. This can be done over telephone lines using devices called *modems*.

Emulator

A *hardware/software* device designed to translate *programs* written for one particular computer so that they will run on another computer.

Firmware

Programs or *data* stored in ROM—either built-in by the manufacturer, or added with a cartridge—that cannot be changed by the user.

Flow chart

A diagram on paper that shows all the logical steps necessary to write a *program*.

Format

To prepare a *disk* so that it can receive and store information. Until you perform this task, the *disk* will not be able

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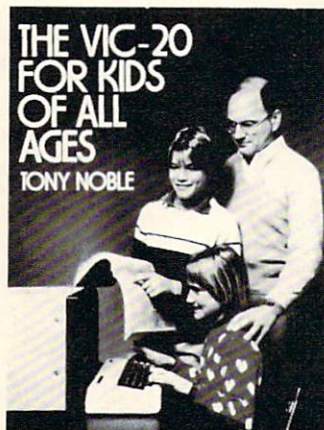
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—*Science News*

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THE PRIMER

THE WORDS

to store any information. The word "initialize" is often used to mean the same thing as format.

Function key

A special key on the computer's keyboard that has been or can be designated to perform a specific task.

Graphics

Pictorial displays on the CRT, such as charts, graphs, and symbols. Contrasted with text.

Graphics tablet

A kind of electronic drawing board. With a graphics tablet and a special pen, whatever you draw will appear simultaneously on the CRT.

Hard copy

Information printed by the computer onto paper.

Hardware

The physical, nonchanging parts of a computer system. Contrasted with *software*, or programs, which can change.

High-level language

A programming language that resembles an ordinary spoken language (e.g., English). BASIC is a high-level language.

Input

Programs or data entered into the computer.

Interface

An electronic connector between the computer and its peripherals.

K

Abbreviation for kilo, or 1,000. When used to describe the amount of *memory*, or storage space, a computer has, it often signifies 1,024. A computer with 16K bytes of *memory*, for example, can store 16,384 characters of information.

Keyboard

Designed much like that of a standard typewriter, the keyboard is used to enter information into the computer.

Load

To enter a program from an external storage device into the computer.

Information services

Broad-based data bases that offer a variety of services, ranging from airline reservation information to stock market quotations. You need a *modem* to link up with such a service.

LOGO

A programming language that allows the user to draw pictures on the screen. LOGO is particularly good for teaching young children how to program.

Loop

A statement in a program that instructs the computer to repeat a certain task.

Machine language

A binary code consisting of "0s" and "1s," which is the only language a computer understands. Programs written in any other language, such as BASIC, are translated into machine language for processing.

Membrane

A type of computer keyboard with a flat, smooth surface.

Memory

The place in a computer where data and programs are stored.

Menu

A list on a CRT of the operational options of a computer program; a list of programs stored on a tape or disk.

Microcomputer

A small computer designed primarily for home or small business use. The micro can do today what many room-sized mainframe computers did 20 years ago.

Microprocessor

A tiny processor on a single chip. The "brains" of all microcomputers, it is also found in many consumer and industrial products.

Modem

A contraction of Modulator/Demodulator. A device that makes it possible to transmit and receive computer data over telephone lines.

Monitor

A device for visually displaying a computer program or the results of that program on a screen. See CRT.

Network

A system of linking computers so that users can share resources and exchange information.

Operating system

A program that controls the operation of a computer system, such as controlling signals to the disk drive or printer. When a computer system is turned on, the operating system is the first program executed. All subsequent pro-

grams are loaded and supervised by the operating system.

Output

Computer-generated information that is transferred to a monitor, disk, tape, or printer.

PASCAL

A programming language that can be used on many microcomputers. While it is considered more difficult to learn than BASIC, it can generate programs that run faster and use less memory.

Peripherals

Hardware accessories for a computer, such as a disk drive, printer, or modem.

Pixel

Stands for "picture element." A single dot of light on a TV screen or computer monitor. These tiny elements are used to create electronic pictures, or graphics.

Plotter

A machine, attached to a computer, that prints lines or graphs on paper.

Printer

A machine that transfers information stored in the computer onto paper. Two of the most commonly used printers are: dot matrix—a printer that forms text or graphics using a group of individual points (dots); and letter quality—a printer that prints fully formed characters (like a typewriter), using a type element called a "daisy wheel."

Program

A set of step-by-step instructions that tells a computer how to solve a given problem. Also, to prepare such a set of instructions.

Programming language

A language, with clearly defined rules, that can be used to express a computer program.

RAM

Random Access Memory. An area in the computer where information is stored. When called into this area, information can be read, changed, or edited. However, it will be lost when the computer's power is turned off, unless you first save the information.

Read

The process of copying information from a storage device (such as floppy disk or tape) into the computer's memory.

Reading only copies; it does not erase the data from where it is stored.

Resolution

The sharpness of a picture on a CRT, usually described as "high" or "low." The higher the resolution, the sharper the picture. Resolution is expressed by the number of pixels in the display. For example, 560x720 is much sharper than 275x400.

ROM

Read Only Memory. Permanent memory built into a computer by a manufacturer. The information stored here gives the computer operating instructions when it is first turned on. The user cannot change this memory, but "only read" it.

Save

To store information from memory on tape or disk so that it can be used again.

Software

Computer programs. Also, tapes and disks.

Stringy floppy

A computer storage device that holds a magnetic tape, called a wafer. The enclosed wafer tape is thinner, narrower, and faster than conventional cassette tapes.

Terminal

A computer user's workstation. Also refers to the computer screen where information is displayed.

Text

Words, letters, and numbers that appear on a CRT. Contrasted with *graphics*, which are lines, shapes, and symbols.

Winchester

A type of hard disk that is sealed in an air-tight, dust-free container. See disk.

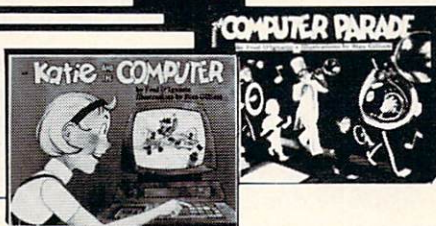
Word processor

A program that allows the user to write, edit, or rewrite text. The text can be saved on a storage device and printed out. A word processor allows the user to make changes in the same text without retyping the whole page.

Write

The opposite of *read*. To transfer information from the computer's memory to a storage device such as a floppy disk. Write-protect is a procedure for preventing a disk from being written to.

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THE PRIMER

THE SETTING

It takes care to shop for a computer. It takes still more care to set it up properly. Reading the directions thoroughly is important. So is common sense. Today's personal computers may be sturdy machines, designed for many hours of use, but they can also be sensitive and finicky. Here are six steps to get you off and running.

1. Setting Up

When you open the box, check the manufacturer's packing list (or manual) to make sure you have all the parts. If you don't, call the store immediately.

Set the computer in an area that won't get a lot of traffic. And keep in mind that the computer will function best at normal room temperature. In unusually cool or damp rooms, such as an unheated basement, the computer will need some time to warm up.

Keep the surface around the computer clear, so the machine can get good air circulation when working. Even those machines that have inte-

rior fans need air movement to keep from overheating.

As with a TV, position the monitor away from sunlight glare, which can cause eyestrain. And, if you have a printer, try to place it on a separate table, so that its vibrations don't jiggle the computer.

2. Beware of Static

If the computer room has a rug, beware of static electricity. Small doses of static can cause the computer to speak gibberish; large doses may cause real damage. Static electricity is most likely to build up in winter months, when rooms are hot





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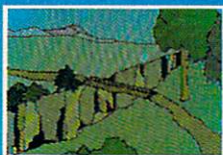
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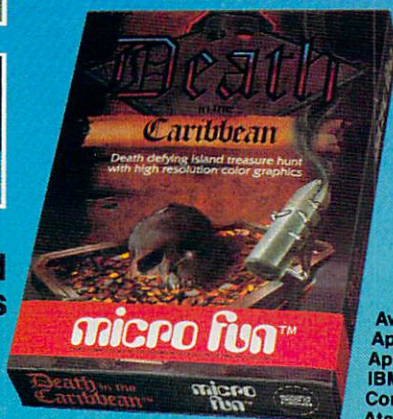
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THE PRIMER THE SETTING

and dry, but it's easy to combat—just spray the rug with a mild mixture of fabric softener (such as Downy or Stay-Puf) and water. If the static recurs frequently, you may need a humidifier or static mat.

3. Plugging In

Buy a power strip, available from most hardware stores for around \$20, to eliminate the massive tangle of cords and wires from your computer, video monitor, disk drive or tape deck, and other peripherals. You don't want small children or pets to bring the whole system crashing to the floor. And don't plug heavy appliances into the same outlet as the computer. When turned on they will cause a sudden drop in voltage, which may play havoc with the computer.

4. No Food or Drinks Allowed

Do not eat or drink near the computer and its accessories. Foreign substances, including spills, dust, and smoke, can destroy programs on cassettes and disks—and they will slowly wear down the computer, cassette player, or disk drive.

5. Safekeeping

To protect programs, keep all cassettes, cartridges, or disks in tightly closed boxes out of reach of small children and pets. The boxes should not be near magnets or magnetized tools, which may erase programs. Disks are especially sensitive (more so than records), and can be ruined by a thumb print. Treat them gingerly, as if they had a "Wet Paint" sign on them. Valuable programs should be copied and stored elsewhere, as a form of insurance. The owner's manual will explain the copying process.

6. Read Before You Leap

Before using the computer, read the manual carefully. Even though you can't do the computer much harm by experimenting with the keyboard, you will save some initial frustration by memorizing basic instructions. It may pay to copy these instructions and tape them on the wall in front of you. In any event, keep the manual nearby, preferably on a shelf with your programs.

Don't worry about the whirring or clicking sounds the computer makes when storing or retrieving data. These are, after all, just the sounds of a machine with a giant memory at work.

THE PRIMER SHOPPING DOs AND DON'Ts

Shopping for a computer is unlike any experience most of us have ever had. It's unnerving even to those who previously found shopping a form of recreation. In addition to the fact that most of us feel dumb and vulnerable when we walk into a computer store for the first several times, there's the fact that we are. Most first-time buyers know very little—even about why they want a computer. Few know much about the technology, its applications, or the specific products available. Many salespeople know little more.

There are a number of specific steps that will increase the comfort level in this tension-producing situation. Here are 10 shopping guidelines:

1. Figure out who in the family will use the computer, and for what purposes. When you shop, take along your list of these objectives and measure the computers you see against them. Take brochures home to read in your favorite chair.

2. Many experts say that after you decide why you want a computer, find out which software is best to accomplish that task and then find the hardware it fits. Don't start the other way around, they advise. Sometimes shoppers get so caught up with the equipment, they don't pay enough attention to the software. But the greatest computer in the world is not much use without the software you want.

3. Ask plenty of questions. Ask the same questions of different people. Then ask more questions. Don't be afraid of appearing "stupid," because there's no reason you should know anything about computers. Make sure you get answers you understand. Don't be intimidated by jargon. The person using it may not know much more than you do. To meet people who are using the computers you are considering, attend a local user-group meeting.

4. Be sure you know what you're getting for the money. You need more than just the keyboard unit, which is what most advertising refers to. You also need a cassette recorder or disk drive to run programs, and a monitor or TV to see what's going on. And, if you want copies of your work, you'll need a

printer. Many of these add-ons cost more than the keyboard unit itself. If you're buying peripherals, ask about what you need to hook them up and get them working. There are lots of extra costs, and not all salespeople volunteer this information.

5. Demand a demonstration, and try out any computer you're thinking of buying. Finding a comfortable keyboard is important—pretend you're testing a new car.

6. Read magazines to see where the industry—and any computer you're considering—is heading. You want to make sure you'll have an array of software and equipment to choose from in the future. In this regard, be wary of promises made by manufacturers or retailers about forthcoming products. They can take months to materialize; and the promises often vanish into thin air.

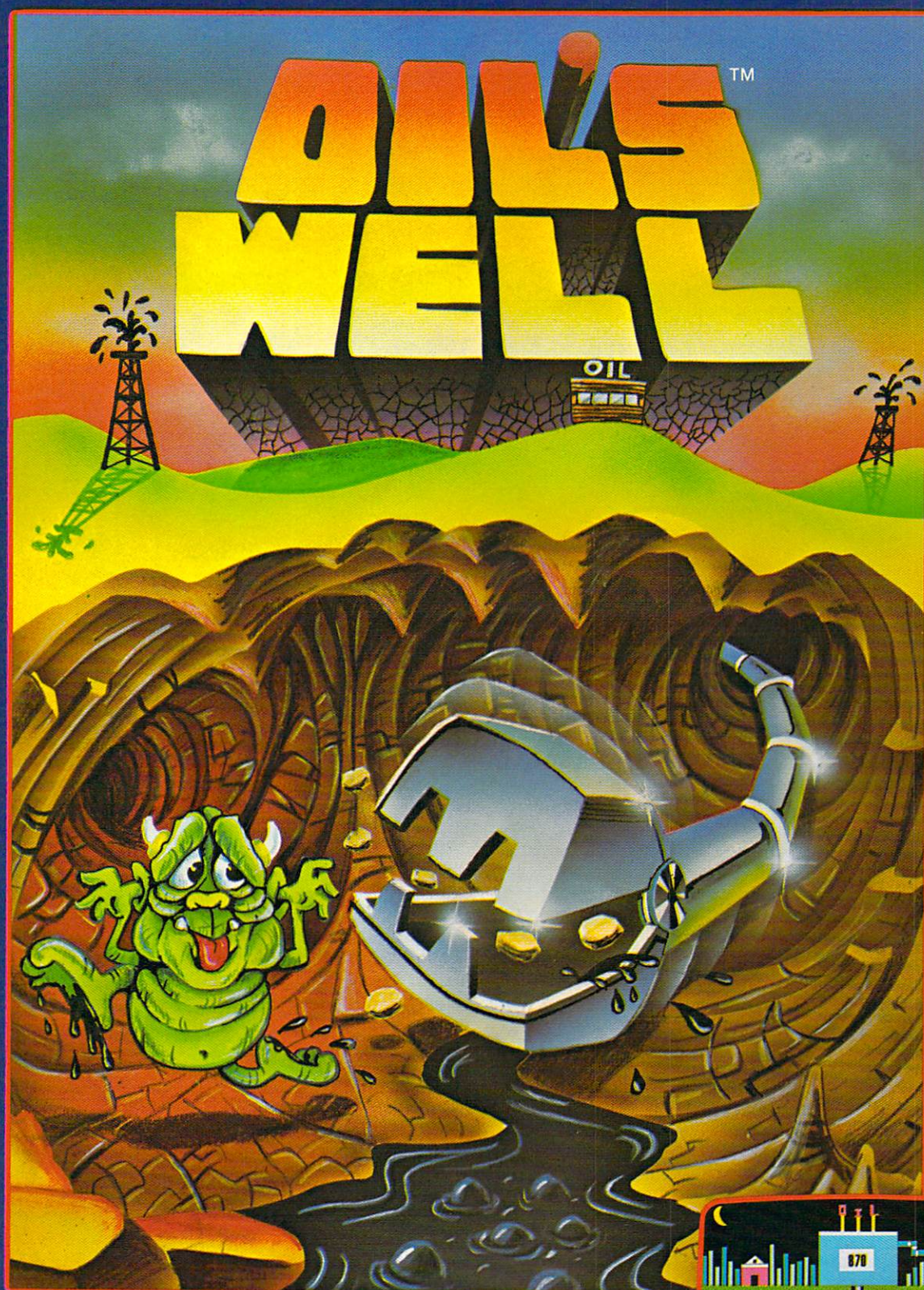
7. Discounts are great, but there's no such thing as a "free lunch." Though you pay more when buying from a certified dealer, you generally get better service. If you're buying from a department store or through mail order, find out where you have to take or send the computer for repair. Sending a computer to Timbuktu is no bargain.

8. Don't rush things. Take the time to comparison shop. As you learn more, your ideas about what you want will probably change.

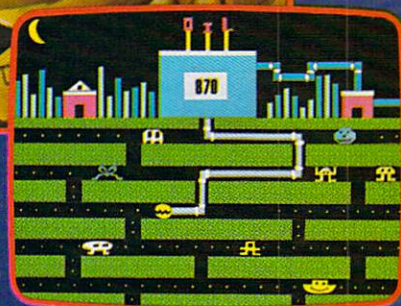
9. One addendum to the last point. Don't wait for a state-of-the-art machine, unless you prefer twiddling your thumbs to exercising them on a keyboard. There are any number of reasonably priced computers on the market that will keep you and your family entertained and challenged for several years.

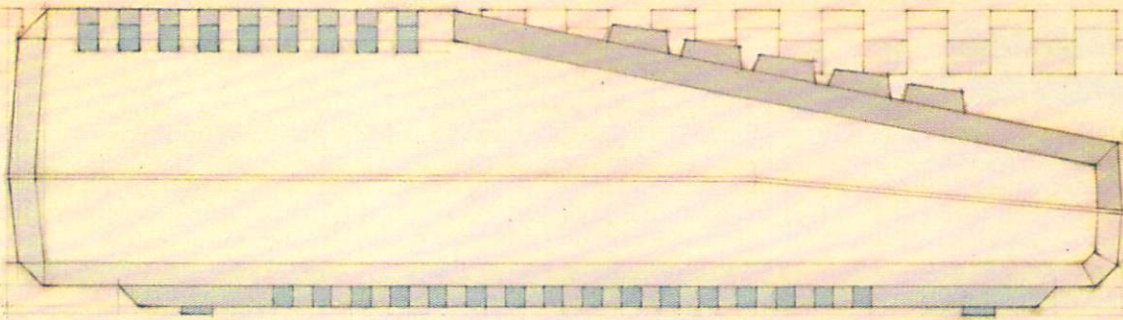
10. If you're having trouble finding a computer that satisfies the needs of everyone in your family, consider this option: Buy a low-end start-up computer for the children (or put their allowances toward it) and another more sophisticated computer that suits you. This is better, and not much more expensive, than buying a "compromise" computer that satisfies no one.

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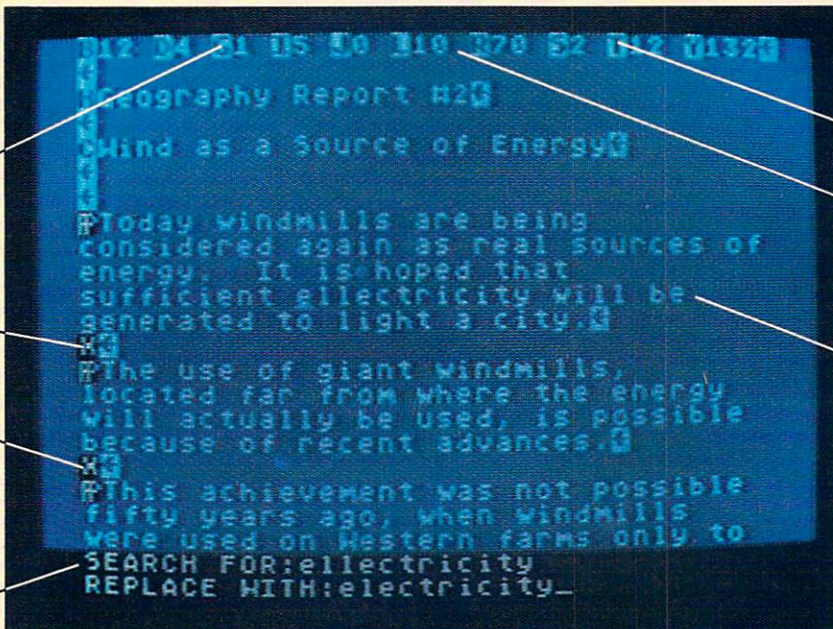
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THE PRIMER

COMPUTER CARE

tions to determine whether this is a do-it-yourself or a repair-shop job. If you have a daisy-wheel printer, the wheel can be cleaned with a kit much like those used for typewriters. You should be able to find one at your local computer store.

CABLES

The first thing to do with the cables is to make a diagram of what is

plugged in where, and why. It can save a lot of headaches when the cables are accidentally pulled out or the computer is moved.

To child- and dog-proof the cables that run along the wall or floor, gather them with rubber bands or cover them with electrician's tape (available at any hardware store). Avoid running cables along the floor where they can catch someone's foot

or be stepped on.

As a rule, good prevention techniques will help you avoid a variety of problems. Be sure to set up strict rules for home use of the computer and clear responsibilities for each member of the family. And if there's a problem, consult the accompanying chart. If you still can't get the computer running properly, call your dealer or repair shop. **FC**

WHAT WENT WRONG?

Although it is a good idea to develop an ongoing relationship with someone in your neighborhood who can fix your computer or advise you about repair problems, you won't want to place hysterical phone calls every time something appears to go wrong. The following chart includes some problems that dealers

around the country cite as the most common. There are many things computer owners can do on their own, but the experts stress that you should never attempt anything that makes you nervous. The biggest danger in computer care is when the inexperienced person reaches his or her hands inside the machine.

| PROBLEM | PROBABLE CAUSE | CURE |
|---|---|--|
| The image on the screen blinks on and off intermittently. | Defective cable or receptacle. | Watch the effect on the screen as you move the cable back and forth to be sure it is a problem with the cable. You can check the specific cable by replacing it with a working one borrowed from a friend. If your cable is defective, it will need to be replaced. If moving the cable has no effect on the screen, it is most likely a receptacle problem and you will need to take the computer in. |
| The screen shimmers, blanks, then comes back on . . . you've lost what you are working on. Or the image on the screen grows very faint. | Static, a surge of voltage through the cables, or a "brown-out." | The best cure for this problem is prevention by both putting the computer in a static-free environment, and using a voltage-surge protector and an Uninterrupted Power Supply unit. |
| Programs won't load properly. | Something in the disk drive: dirt, corrosion, or the dog's bone. | If there isn't a bone, think about the last time you cleaned the disk drive heads . . . then do it. |
| Something is spilled on the keyboard or the casing is cracked. | Someone wasn't following the house rules. | Don't try to clean it. Just unplug the computer and take the keyboard in to your dealer. |
| The cord has been chewed. | The dog. | Unplug the computer, then detach the damaged section of cord and take it in for replacement. |
| Strange lines, letters, or symbols appear on screen. | Most likely the ROM or RAM chips. | If your computer has removable cards, replace them with a friend's cards to see if yours are defective. It could also be that heat has caused the ROM and RAM chips to expand and become loose. All you need to do is open the computer and press down on the chips for a good contact. (CAUTION: Opening some computers voids the warranty.) |
| The disk drive doesn't sound right. Or "read" errors appear on the screen, e.g., "ERROR ON DRIVE B." Or a program won't run. | Disk drive alignment or revolutions are off. Or the heads are dirty and worn. | It's normal for a disk drive to run at about 288 revolutions per minute—plus or minus four. If the speed is off, especially if it's too slow, you will get those symptoms. It happens most often when you have used someone else's disk drive to copy a program. You might be able to avoid a trip to the repair shop with the help of a speed adjustment disk, available for less than \$20. It's a good idea to have a program like this on hand for such occasions. Check your local users' group about the program for your computer—there may be a no-cost one in the public domain, as with the Atari. If you have cleaned the heads (as you should do every two months) and adjusted the revolutions, and you still have problems, most likely you have alignment problems and need to take the disk drive in for repair. |
| The computer simply won't work! | It could be something special . . . follow your checklist. | 1) Are the cables all plugged in according to your chart? 2) Is the disk in correctly? Not backwards or upside down? 3) Are you sure the disk has information on it? |

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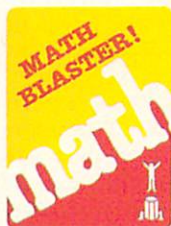
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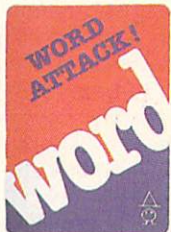
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AVOIDING THE "PIANO LESSON SYNDROME" Computers Strike the Right Chords with Kids

BY BARBARA SCHWARTZ

Kids and computers are a natural. People below the age of 18 seem immune to the phobic anguish that cripples so many of the older generation when confronted with a keyboard and screen. Children just sit down and start hitting the keys, and before you know it, that fearsome computer is meekly doing their bidding. You might even be reading this magazine while you're waiting for your own offspring to get back from a hard afternoon's work at the local computer store so that you can finally get an answer to that question about *VisiCalc*!

That's the good news. The bad news is that there are still some kids who aren't caught up in the computer craze, and some of their parents are getting frantic. A client called me recently demanding to know what computer she should buy for her children. "What do they want to do with it?" was my first question. "They don't want to do anything with it," she snapped. "I want them to use it to prepare for the SATs!" These budding Ivy-Leaguers, incidentally, are seven and nine years old!

FROM PAMPERS TO PROGRAMMING

More and more of the flak I'm hearing from worried parents gives me a bad case of déjà vu. Do you remember your parents insisting that you learn piano (ballet, tap dancing, or whatever your childhood nemesis was) because "you may not like this now, but someday you'll thank me for making you do this"? Maybe you even enjoyed your lessons, but not quite in the way your parents had in mind—"It's nice that you're playing the piano, but must it be that deadly rock junk?"

Substitute computers for the piano and video games for rock and you'll hear the sounds of some of today's parents—frantic that Junior will never make Harvard if he doesn't start programming weeks af-

BARBARA SCHWARTZ is a computer consultant, writer, and teacher. She is currently besieged by clients, friends, relatives, and random strangers who want to know which computer to buy for their family.



ter graduating from Pampers. Unfortunately for these parents, kids are notoriously hard sells on things that are "good for them."

Weren't we? I remember my piano teacher screaming that I was fighting my lessons, and I guess I was. At eight years old, I wasn't terribly interested in the "someday" when it would be nice to know the piano.

So if your children aren't all fired up about the computer, don't work yourself into a frenzy. And don't rush out to buy a computer trusting that they'll turn on immediately, unless you want it to suffer the same fate as those forlorn bunnies two weeks after Easter. A friend of mine wanted to make sure that his son's new computer would be a birthday "surprise," so he showed super-human self-control by not dropping even one hint. The son was surprised, but so was Dad. His offspring stolidly refused to even look at the machine, demanding tennis lessons instead.

SIT DOWN AND TALK

Sit down and talk with your kids about computers before you go into a single store. Ask them what they already know about the machines and what they like. Most children have worked or played with a computer at school or at a friend's house and they usually have pretty strong opinions. Some like to play *Pac-Man*, others might want to use the *Bank Street Writer* to put out a local

newspaper, and still others yearn to draw pictures in glowing color. We didn't all read the same books as children; there's no reason that all children should do the same thing with their computers.

Your next step is to take your children with you when you go shopping (this is especially important if they haven't already been exposed to computers). Of course, inform them of the state of the family exchequer before you leave so that they don't fall in love with that cute Apple Lisa, which retails for a not quite so cute price.

Once you're at the store, let them loose on the machines. The salespeople won't be at all surprised; at many stores it's impossible to demonstrate a computer to an adult without clearing away a covey of kids. Ask them if they like the keyboard on a particular machine, if they think the graphics are up to snuff, and if the programs that are available for the machine do what they want (Do they like the word-processing programs? Does the accompanying BASIC manual seem easy to read?). Make your children feel that the computer is something they're going to enjoy, not just another prod on the fast track to college.

IF IT DOESN'T TAKE, DON'T PUSH

And, please, if this exposure to computers doesn't take, don't push. Repeat under your breath, "Remember those scales, do I want to do that to my children? When was the last time I played the piano?"

Besides, time and peer pressure are definitely on your side. The child who is cool to computers today may just come home in a few weeks exclaiming, "Jeffrey has an Apple, and it does all of these neat things. I want one just like it!"

The soft sell will not only spare your kids from those tedious "use the computer, it's good for you" arguments, it also might enable them to discover the rich world of computers on their own. Then, your first family project might be to write a program to keep track of who gets to use the computer and when! **FC**

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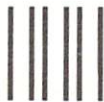
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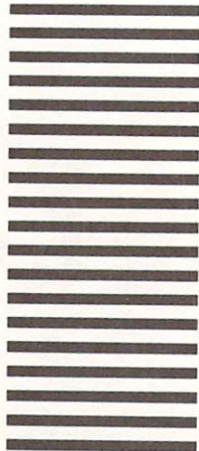
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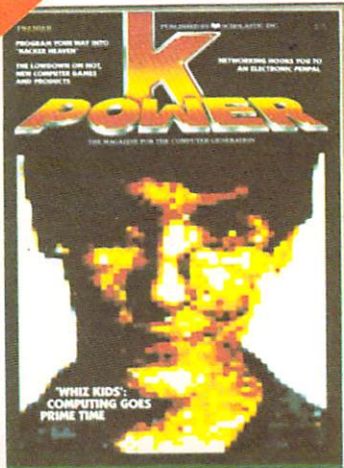
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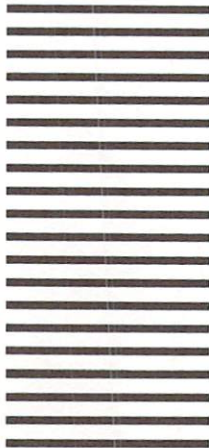
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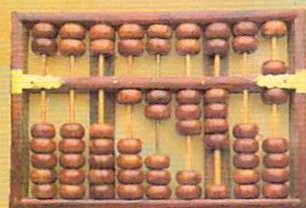


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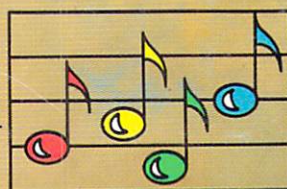
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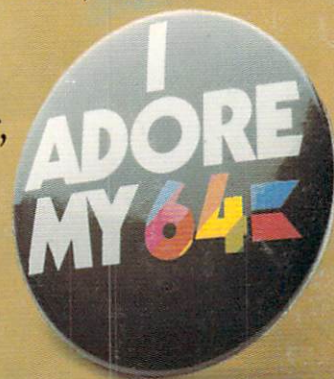
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